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ABSTRACT

This collection of activity guides was produced for The Handicapped Children's Nature Study Center in Davenport, Iowa. The guides are designed to be used in any outdoor area by elementary teachers of either handicapped or "normal" children. Te emphasis is on guiding students into our outdoor world, to help them begin to observe, explore, and experiment in outdoor activities. Purpose, objectives, concepts, activities, and resources are described separately for each of the major components of our environment: air, soil, water, plants, animals, and man. Also included are a general comprehensive overview of the six components; an appendix including descriptions of how to build a variety of items useful in observing plants and animals; resources for lead-up and supplemental activities, phonograph records, and bibliography; and a set of sample evaluation instruments. This work was prepared under an ESEA Title III contract. (BL)

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MINI-EXPLORATIONS OF OUR ENVIRONMENT

SE 014 430

Charles J. Wester, Consultant
Dr. Paul J. Staskey, Director

a TITLE III, E.S.E.A. project
Administered by
Muscatine-Scott County School System
1523 S. Fairmount
Davenport, Iowa 52802

UNIT II

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INTRODUCTION

A. Introduction to Unit II

"Mini-Explorations of Our Environment" is designed for teachers of handicapped students as well as teachers of 'normal' students. Its purpose is to encourage and guide the teacher in encouraging and guiding his students into our outdoor world, and to help them begin to observe, explore and experiment in outdoor activities.

B. Acknowledgements

Complete credit for the organization and compilation of these guides is to be extended to Clara A. Emlen. Also, special acknowledgement is made to Phyllis M. Ford, Chairman of the Recreational Leadership Program, The University of Iowa; Joe Moore, Science Consultant, and Richard Stebbins, Social Sciences Consultant, for the help contributed in the formation of these units.

C. Suggestion for Use

It is suggested that these guides be used in the order they are presented. Each guide, however, has been so developed as to enable the teacher to use any one of the guides as she feels it will fit into her curriculum.
It is further suggested that the guides be carried out in the out-of-doors, preferably at the Handicapped Children's Nature Study Center, Fairmount School, 1523 South Fairmount Street, Davenport, Iowa 52802. Each guide, however, is designed to be used in any outdoor area — school yard, vacant lot, city, county or state park, nature area, cemetery or neighboring property. (Permission should be granted for use of non-public property.)

These guides are just that — guides. They are not designed to be followed word for word — so closely that the teacher does not gear the lesson to the particular spot in the out-of-doors, as well as to her students' capabilities and the existing curriculum. It is hoped that the teacher will use these plans as guides, and design her own questions, activities and evaluations for her own students, curriculum and spot in the out-of-doors.

It is hoped that these guides will serve as a foundation and continual stepping stones to further outdoor activities. These are ends in themselves, but hopefully also, they are means to further activities.

Unit II

I. BRIEF GENERAL OVERVIEW OF THE MAJOR COMPONENTS OF OUR ENVIRONMENT

A. Aim

To explore and begin to understand that our environment is made up of air, soils, water, plants, animals and man.

B. Purpose

As a basis to benefitting the utmost from further environmental education programs there is a need to lay a foundation of what our environment is. The students have begun to get the feel of observing our environment through their senses in Unit I; now they should begin exploring their environment more closely. It is felt that then they will begin to understand the environment.

There is also a need to know what our environment is like, not only now, but what it was in the past and is likely to be in the future.

Will we always have this particular environment here? How can we keep it useful and productive to all as well as safe and aesthetic?

By pointing out each part of the environment and by having each student use each sense specifically, the teacher will help the student become ready for succeeding lessons. Further, the student can use these experiences to help become a participating citizen in his society.

C. Educational Objectives

1. Each student should observe, using as many senses as practical, the six major parts of the environment (or the effect of one part on another).

2. Each student should observe several different soils.

3. Each student should observe several different aspects of the atmosphere.

4. Each student should observe water in several areas.

C. Educational Objectives (con't.)

5. Each student should observe several different plants.

6. Each student should observe several different animals or signs of animals.

7. Each student should observe man's activity in the out-of-doors.

8. Each student should observe the environment as a whole - "The Web of Life" - ecology - interdependency of all six components.

D. Concepts

1. We have five senses to use in observing our environment.

2. There are six major components to the environment.

3. There are different soils to be observed.

4. There are different odors and aspects of the atmosphere to be observed.

5. There are different types of waters to be observed.

6. There are different plants to be observed.

7. There are different animals to be observed.

8. There are different ways man acts and is observed in the out-of-doors.

9. All six parts of our environment are interrelated and interdependent upon each other.

10. Each person may observe differently from another.

11. Component parts within one area of the environment may differ from parts in another area.

12. There are ways to act in the out-of-doors in order to use our out-of-doors wisely.

E. Activities

1. Suggested Lead-Up Activities

a. Carry out Unit I - Observing Our Environment Through Our Five Senses. Be familiar with and able to use all senses in observing an environment.

b. Browse through books for six parts of our environment - see appendices.

c. View films for six aspects of our environment - see appendix for listings.

E. Activities (con't.)

d. Look at pictures, slides, film strips, etc. - of six parts of our environment - differences and similarities within each - example - Water - swimming pool, bog, pond, stream, ocean, rain, marsh, lake, etc.

2. Activity Procedures

Preferably in small groups, the teacher has the students carry out the following activities:

Briefly observe the six major aspects of our environment - either in a particular spot out-of-doors, or have samples of each in the classroom (bottles, cages, terrariums, cans, etc.) or utilize several different visual aids (films, magazines, film strips, books, charts, etc. - check the materials section and/or the appendix). In order to use as many of the senses as possible it would, of course, be best to be outside. Ask students questions about each component to get them to see, feel, hear, smell, think.

The six major activities cover a <u>brief</u> overview of the resources of the environment. Optional activities are included if you prefer to spend additional time with this first guide.

a. <u>Air</u> Have students observe through sight, feel and smell several different aspects of air, such as smoky air, clear air, cloudy air, smoggy air, wet air, dry air, etc.

Optional - Have students look for examples of air in which we see colors (rainbow, sunset, sunrise, etc.).

Optional - Have students observe what happens when air has other elements mixed with it (clouds, smoke, etc.).

Optional - Have students observe how far they can see when the air is clear (stars, sky, moon, etc.).

b. <u>Soils</u> Have the students walk in a natural area and feel, see, smell different layers, colors, and textures of soil.

Optional - Have the students feel, see, smell samples of soil brought to the class. Specific soils should include sand, top soil, clay, mud, humus and rock and a variety of colors. Students should feel and smell each type when dry and when wet, etc.

E. Activities (con't.)

c. Water — Have students observe different forms of water such as drinking water, puddles, rain, streams, ponds, muddy water, clean water, dirty water.

Optional-Have students collect and discuss pictures of water in different forms.

d. Plants — Have students observe through sight, smell, touch and perhaps some hearing and tasting a variety of plants. Important plants are trees, flowers, grasses, ferns, and mosses. Students can feel leaves having different textures, and smell different flowers. They can listen to the wind in the dry leaves or in the branches.

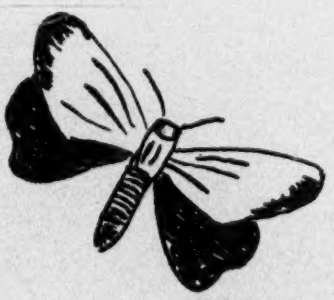
Optional- 1) Students could find plants of different sizes, colors and textures.

2) Students can observe the parts of plants (root, stem, leaf, flower and seed).

3) Bring edible plant parts to the children (corn, squash, lettuce, carrots, etc.).

4) Have students taste plants such as mint.

e. Animals — While walking in a natural area, have students look for animals or signs of animals. They should look up, down, near and far. Types of animals they may observe are: insects, birds, amphibians (frogs), reptiles (snakes), worms, mammals (cats, dogs, squirrels). Signs of animals they may observe are animal homes, footprints, fur, gnawings. Students can discuss the concept that animals are many sizes, and live in many places.



Optional-Have students collect and show pictures of many animals.

f. Man — Have students look to see things man has done (build houses, make roads, drop litter, cut trees, etc.). Have students listen to sounds caused by man (voices, traffic, machines, lumber yard, etc.). Have students smell odors caused by man (garbage, smoke, factories - sulphur, hot dogs, asphalt, etc.).

E. Activities (con't.)

g. Environment as a whole - (All Six Components) Have students look at one small area to see if, without walking around, they can observe some of all six components of our natural resources or some proof that all have been in that one area. For example, students observing one corner of a natural area may see: a tree, some soil, dew, a bird's nest, blue sky and a person's footprint.

Optional-Have students sketch what they liked and what they did not like.

3. Materials & Definitions

a. "Things" from each aspect of our environment - air, water, man, plants, soil, animals - which students can - feel, see, hear, smell and possibly taste. A terrarium is one way (check the appendix).

Visual aids may be used in this brief introductory guide but it's the out-of-doors we're talking about so let's try to be there. Even the front school yard, the playground, a vacant lot or a neighbors yard for a short time would all be suitable areas. For those groups carrying out this guide indoors - use a variety of visual aids as noted under resources.

b. Vocabulary - Use words new to your particular group and/or words needing reinforcement - man, animal, plant, soil, air, water and words within each environmental component.

Definitions - 1) Air - The gas surrounding the earth. The material we breath.

2) Soil - The part of the earth's cover in which plants can grow.

3) Water - Liquid which falls in the form of rain or snow and forms ponds, rivers, oceans, etc.

4) Plant - A living being which does not move from place to place. It usually has green leaves and grows from roots in the ground.

5) Animal - A living being which can move from place to place.

6) Man - An animal with the ability to think, reason, choose, and decide.

4. Time and Place

Any time that fits your curriculum.

Any place out-of-doors or in the classroom.

Length - Up to one hour for all six components. It is suggested that you spend more time using the next six guides, one for each environmental component.

F. Related Curriculum Activities

As mentioned in the Introduction, Outdoor Education is not just another curriculum, it is largely methods in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

1. Physical Education - Act or dance as different wildlife using their senses; act as wildlife with pronounced senses; act or dance as a plant growing, water in a stream or rain falling, soil warming and cooling, man littering and cleaning up, etc.

2. Recreation - Discuss and/or view pictures, slides, films - of what students might do after school; with families, friends; over holidays, vacations, etc. - water, (swim, boat, sail boats); soil (garden, trails, etc.); air (barometer, thermometers, etc.); man (conserve, litter, play, etc.); plants (flowers, vegetables, seeds, etc.); animals (bird counts, individual animal observations, insect collecting, etc.).

3. Music - Listen to nature's sounds in each of the six environmental components - out-of-doors or phonograph recordings. Sing songs - land, water, weather, animals, etc.

4. Art - Sketch representatives of each environmental component. Sketch what you heard or saw or felt or smelled or possibly tasted in each environmental component. Perhaps write or tell a story to go with the sketches.

G. Combined Activities

1. Group terraria - Gather several plants, animals, soils, put in a gallon jar, observe, discuss, chart, etc. (Instructions and materials in appendix).

2. If your first activities were carried out within your classroom, carry out the same or similar activities actually in the out-of-doors.

3. Carry out same or similar activities in one or more particular spots weekly, monthly, seasonally - using five senses in observing similarities and changes or differences in each environmental component from one time to another.

H. Evaluations (see appendix for sample instruments)

1. Check List
2. Fill-In, Drawing, Sketching, Writing, Etc.
3. Objective
4. Subjective
5. Teacher Comments on Behavior
6. Verbal Tests of Students Knowledge

I. Suggested Further Activities

1. Go on with Mini-Exploration Guides by environmental components - II. A, B, C, D, E, F, and III.

2. Repeat this guide both in the classroom and around the school or in different spots in the neighborhood. Use the same and/or more questions for each environmental component, or a particular aspect needing practice, or where interest is (but, don't neglect the point of both Unit I and Unit II - to use and realize all five of our senses in all six environmental components).

3. Begin relating the senses to nature, all six areas, as much as possible. Write, talk, do math, social studies, English, etc. not only in the out-of-doors but, <u>through</u> the out-of-doors and for carry over values - <u>for</u> the out-of-doors.

J. Resources

The following listing will be updated as additional materials are received and/or reviewed by the H.C.N.S.C. In addition, please consult the appendix and the IMC book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available at or through the H.C.N.S.C.

1. <u>BOOKS</u>

<u>All Around You: A First Look at the World</u>
Bendick, Jeanne

<u>Andy All Year Round</u>
Merriam, E. I.M.C. #15115 (P) 525

<u>Find Out by Touching</u>
Showers, Paul
Crowell, $2.95

<u>My Five Senses</u>
Aliki I.M.C. #11882 (P) 612

<u>Nature Notebook</u>
Candy, Robert
Houghton Mifflin Co.
Boston, Mass.
1953, 114 pp., $3.00

<u>Question and Answer Book of Nature, The</u>
Saunders, John R.

* <u>Tale of a Meadow, The</u>
Kane, Henry B.
Alfred A. Knopf, Inc.
New York, New York
1959, 115 pp., $3.00

Unit II - I

J. Resources (con't.)

* Tale of a Pond, The
Kane, Henry B.
Alfred A. Knopf, Inc.
New York, New York
1960, 120 pp., $3.50

* Tale of a Wood, The
Kane, Henry B.
Alfred A. Knopf, Inc.
New York, New York
1962, 119 pp., $3.00

Things
Dunn, Phoebe and Tris

* Trip to the Pond: An Adventure in Nature, A
Hofmann, Melita
Doubleday, Garden City, New Jersey
1966

Young Scientist Takes a Walk
Guide to Outdoor Observations
Barr, George
McGraw-Hill Book Co., Inc.
330 W. 42nd Street
New York 36, New York
1959, 160 pp., $3.00

Audubon Nature Encyclopedia

Encyclopedia Britannica
Encyclopedias with plant, animal, water, soil, etc. color photograph plates

Golden Book Nature Series for Children

Life Nature Library Series

2. CHARTS, POSTERS, FLASHCARDS

* Gull Lake Environmental Education Project
Kellog Bird Santuary
Rt. 1, Box 339
Augusta, Michigan 49012

H.C.N.S.C. has charts on pond life, birds and mammals; also slide and tape sets on pond life and mammals.

* National Audubon Society
1130 Fifth Avenue
New York, New York 10028

H.C.N.S.C. has all charts offered - laminated for full use - plants, birds, trees, ecology, wildflower - hawk, amphibians, mammals.

J. Resources (con't.)

* John A. Gustafson, Treasurer American Nature Study Society R.F.D. #1 Homer, New York 13077	Packet of Nature Study Projects and Nature Photographs
* Society for Visual Education, Inc. 1345 Diversey Parkway Chicago, Illinois	H.C.N.S.C. has "Picture Story Study Print Sets" - with 33 1/3 rpm 12" record - Spring Wild Flowers, Familiar Cloud Forms, Familiar Birds, Wild Animals, Common Birds, Common Insects.

3. <u>FILMS, FILM-STRIPS, SLIDES</u>

"How We Look at Things" Kalamazoo Nature Center 7000 North Westnedge Kalamazoo, Michigan 49001	$10.00 rental 27 minutes Color, sound, 16mm
Iowa State Conservation Commission Des Moines, Iowa or your local district	Check the film and slide catalogues for various titles
"Lands and Waters of Our Earth" Coronet Films 65 E. South Water Street Chicago, Illinois 60601	Color, b/w 11 minutes
"Learning With Your Senses" I.M.C. #03409 (P)	
"Patterns of the Wild" U.S. Forest Service U.S. Department of Agriculture Washington, D.C. 20250 or Your region 633 W. Wisconsin Ave. Milwaukee, Wisconsin 52303	And many other titles
"Rickey's Great Adventure" Hank Newenhouse, a Div. of NOVD 1825 Willow Road Northfield, Illinois 60093	Film No. 777, Atlantis Production, Primary, 11 minutes, Color, $125.00 - Rental $12.50
"Senses, The" Sigma Ed. Films Hank Newenhouse, a Div. of NOVD 1825 Willow Road Northfield, Illinois 60093	Film No. 504, Primary, Color, 10 minutes, $125.00 Rental $12.50

J. Resources (con't.)

Society for Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois 60614

Write for catalog of film strips

"You and Your Five Senses"
I.M.C. #03064 (PI)

"We Explore the Field and Meadow"
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

4. MAGAZINES

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The
State of New York Conservation Department
Albany, New York 12201

National Geographic
National Geographic Society
Washington, D.C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D. C. 20036

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D. C. 20036

5. PAMPHLETS, BOOKLETS

Boy Scouts of America
New Brunswick, New Jersey 08903

Merit Badge Pamphlets - 35¢
"Geology", "Bird Study",
"Forestry", "Gardening",
"Insect Life", "Nature",
"Reptile Study", "Soil and
Water Conservation", "Weather",
"Wildlife Management".

J. Resources (con't.)

* National Wildlife Federation
1412 Sixteen Street, N.W.
Washington, D.C. 20036

Wildlife pamphlets - 10¢ each
"Wildlife of Forest and Rangelands"
William L. Reavley
"Wildlife of Farm and Field"
John D. Bulger
"Wildlife of Lakes, Streams, and Marshes"
H. R. Morgan

* Cornell Science Leaflets
New York State College of Agriculture
Cornell University
Ithaca, New York

"Decay" - 25¢
"Reptiles" - 25¢
"Weather" - 25¢
"Snow and Ice" - 25¢
"Water Wonder" - 25¢
"Animal Tracks" - 25¢
"Fungi" - 25¢
"Ferns" - 25¢
"Amphibians" - 25¢
"Nature Poetry" - 25¢
and other similar titles

f. PHONOGRAPH RECORDINGS

"Bird Songs In Your Garden"
.Houghton Mifflin Co.
52 photographs and 10" 33 1/2 rpm record

"Weather Songs"
MR 0322
Motivation Records
(word sheets included)

g. MISCELLANEOUS

* "The World Around You - Our Natural Resources Educational Packet"
The Garden Club of America
Conservation Committee
598 Madison Ave.
New York, New York 10022

* "Observing Our Environment Through Our Senses"
Handicapped Children's Nature Study Center
1523 South Fairmount Street
Davenport, Iowa 52802

Please check the appendices for further resources.

II. GUIDES BY COMPONENTS OF OUR ENVIRONMENT

A. AIR

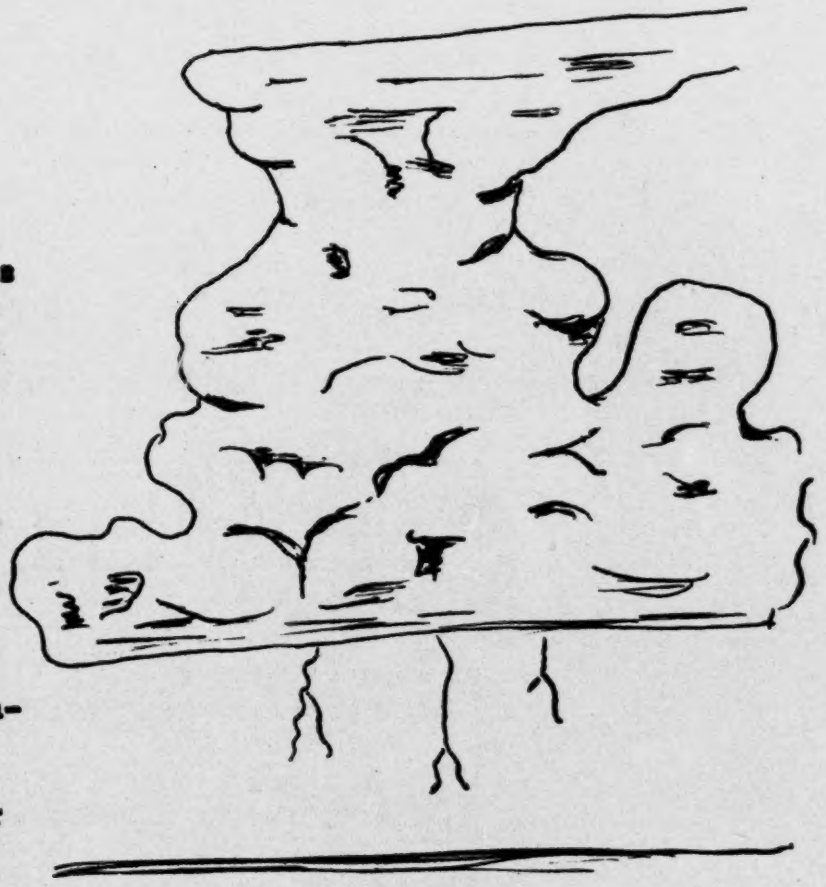
1. Aim

   To begin to explore one component of our total environment through our senses.

2. Purpose

   Presumably, by now the students have begun to become sensitive to their environment by having practiced observing with all their senses. In order for them to understand their environment in its totality, they should begin to use their powers of observation on each of the individual components of the environment.

   Students need to use their senses in exploring environments not only in the Handicapped Children's Nature Study Center and in their classrooms but, almost more importantly, they need to continue their sense observations and explorations with their families and friends as they grow and experience <u>outside</u> their school activities.



3. Educational Objectives

   a. Each student should observe the force of air on other objects.

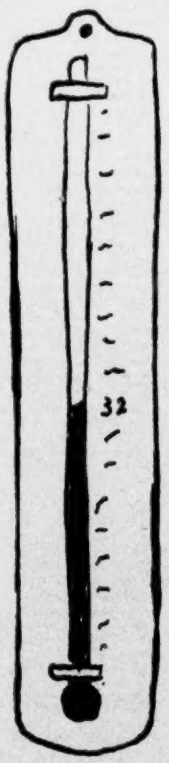
   b. Each student should observe colors caused by foreign particles in the air.

   c. Each student should conduct one or more weather experiments.

   d. Each student should feel, see, smell and taste air in different locations.

II. A.

4. Concepts



a. Air is necessary for life.

b. Air is all around us.

c. Pure air is colorless and tasteless.

d. Impurities give air color and taste.

e. Air can hold evaporated water.

f. Air can carry solid materials.

5. Activities

a. Suggested Lead-Up Activities

1) Carry out Unit and Guide I of Unit II.

2) Discuss the particular activities your group is going to carry out - methods, materials and behavior in the out-of-doors.

3) Discuss the word air - the ga- surrounding the earth, the material we breathe.

4) Look through books, pamphlets, magazines, etc. for the different aspects of air.

5) View films, film-strips and/or slides of the various aspects of air.

b. Activity Procedures

The following activities are all related to understanding the aspects of air. It is suggested that the teacher choose the activities which are most practical and feasible for her particular students. Ideal group size is 6-8. Groups larger than that should have a teacher aide so that no leader is responsible for more than 6 students. This enables all in one group to observe an item together.

5. Activities (con't.)

1) Observation Lotto - Write or picture things to look for (either out-of-doors or in books and magazines and terrariums) on card or paper. Have individual students or small groups and aide fill in their card as in bingo or lotto. Continue until all students fill in all spaces on their cards.

materials - card or paper, pencil to mark or something from nature to mark appropriate square, stick, pebble, grass.

Sample:

HAZE	NOON TEMPERATURE	FRESH AIR
A STRANGE ODOR	BREEZE IN LEAVES	A LONG CLOUD
SMOKE	A ROUND CLOUD	A PLEASANT ODOR

2) Observing our Sky - Have individual students or small groups observe and keep records, charts, on the sunrise, sunset, moon, twilight, and perhaps the stars and planets.

Times the sun and moon rises and sets.
Places the sun and moon rises and sets.
Is it always the same?
In what direction do the tips of the moon point?
Is the moon ever seen during the daytime?
What is twilight? How long does it last? Always?
Can you find the Big Dipper? Is it always in that place?
Are other stars always in the same place? or do they move?
What direction? Same for planets.

materials - cardboard for charts or records. (This activity may take a week, a month or more to complete.)

5. Activities (con't.)

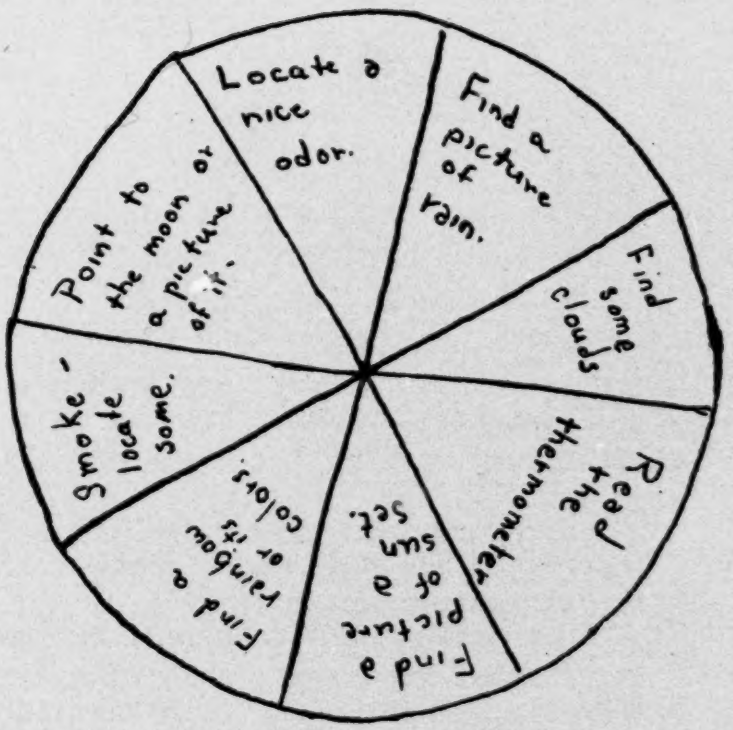
3) You're It - Draw a large circle and divide it into 8 or more sections. In each section write, sketch or paste pictures of forms of air to locate. Gear the instruction - questions to your curriculum, students and available resources. (Maybe your students can give some suggestions for questions).

Push a straight pin into the middle of the circle and put a paper clip over it. Have each student take a turn spinning the paper clip. He follows the instructions in the section in which the paper clip points.

Have students note location, description or make a sketch, or have samples on a table and students point to or pick up correct item, or use book and magazine pictures.

materials - large paper or poster board, compass (or draw circle by hand), natural resources according to questions and instructions or books and magazines, straight pin, paper clip.

Sample:


Locate a nice odor.
Find a picture of rain.
Find some clouds
Read the thermometer
Find a picture of a sun set.
Find a rainbow or its colors
Smoke - locate some.
Point to the moon or a picture of it.

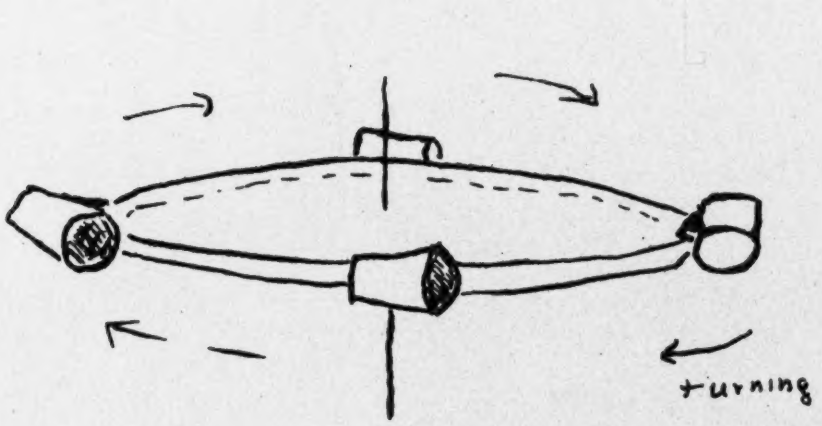
II. A.

5. Activities (con't.)

4) Anemometer - Attach (staple) four cups by their handles to a paper plate so that the cups all face the same direction. Push a straight pin through the plate from the bottom so that the plate move freely. Record how fast (very fast, fast, medium, slow, very slow, and not moving) the wind moves, daily at same times and places. Is the wind constant or in puffs?

materials - 4 paper cups with handles, stapler, paper plate, straight pin, paper, pencil.

Sample:



Calibration Chart - While riding in a car count the number of turns for thirty seconds at five m.p.h., ten m.p.h., fifteen m.p.h., twenty m.p.h., etc. Use this chart to determine the wind speed on the anemometer set up in the school yard.

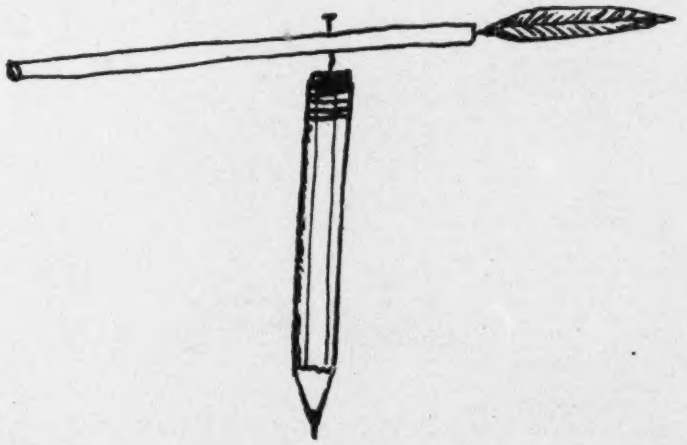
Keep a record of the wind speed at certain times of the day. Also, keep record of the wind direction (direction the wind is coming from), the barometric pressure and the temperature. Be amature weather forecasters, keep a bulletin board for the rest of the school.

5. Activities (con't.)

5) Simple Weather Vane - Stick feather (or one cut from paper) into the end of a straw. Push straight pin through straw about 1 - 1 1/2" from an end and into the end eraser of a pencil so that straw is not crushed and straw moves easily. The free end of the straw shows the direction the wind is coming from. Observe wind in classrooms, out a window, all sides of school, field, forest, stream; keep records.

materials - pencil with end eraser, straw, straight pin, feather, or facsimile from paper.

Sample:



6) Rain Gauge - Pour 1" water into an 8" diameter can then funnel this water into narrow bottle and mark the bottle at the one inch level. Empty the bottle. Fill the can with only 1/2" water and pour into bottle. Mark this level 1/2". Repeat for 1/4 inch. Place can in open area to collect rainfall. After a rain, pour contents into bottle to measure amount. Have students record each day's rainfall or lack of. Place cans in different locations.

materials - 8" diameter can, tall narrow bottle (olives), funnel, felt marker or fingernail polish or similar marker, cardboard for recording.

5. Activities (con't.)

7) Recording Sun and Rain - Each student (or in small groups) has two bags. One color or decoration for sunny and another for rainy. Every day it's sunny put a pebble in the sun bag; every day there is rain put a pebble in the rain bag. Each week or month or semester or end of a vacation have all guess which was most prevalent - sun or rain. Then count the pebbles in each bag.

materials - cloth, oil cloth or other bags - student sew and/or decorate with paints, seeds, beads, pebbles, etc.

8) Sundial - Place a pencil or straight stick into flat moist sand or other cleared soil area. Observe at different times of the day (beginning of school, noon, close of school day) and mark where the shadow falls. Or, put a pencil in a box of moist sand and use a flashlight as the sun. Move the 'sun' from sunrise to midday to sunset and mark those 3 shadow points.

materials - moist sand or other cleared soil area, straight stick or pencil, another stick or marking, box, flashlight (batteries, bulb).

9) Cloud Sketching - Have students observe clouds - their shapes, colors, and moving patterns. Then (or later from memory) have students sketch what they see - either exactly or abstractly. (There is beauty and interest in the everchanging clouds). Display, discuss, record types of clouds.

materials - charcoal, pencil, crayons, colored pencils, etc., paper.

10) Kites - Have students make their own kite (please refer to appendices for directions), decorate with natural dyes or crayons, etc., or buy kites. Then, of course, have the students <u>fly</u> their kites. Try flying them in different weather - quiet, no wind, soft steady wind, gusty wind, strong steady wind. Which is best? Be sure to have clear open space.

materials - refer to book under resources. Newspaper or brown paper, cloth scraps, balloons, strips of light weight wood, natural dyes or crayons, etc.

11) Warm Air - Does it go up or down? Hold strip of paper by one end. It should hang straight down. Now hold it over a hot radiator or hot toaster. Observe, discuss heat raising and cool air sinking. Try outside - hot asphalt and shade.

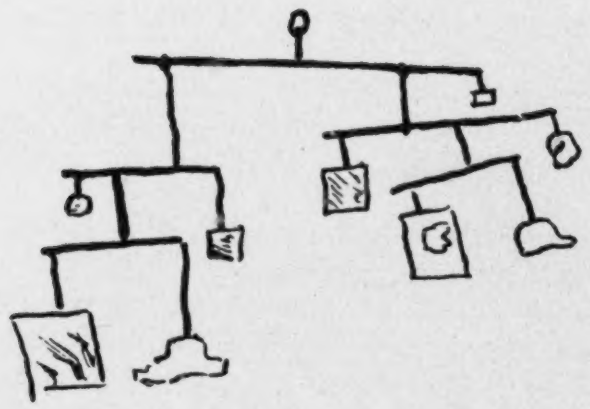
materials - piece of paper about 1" x 6".

5. Activities (con't.)

12) Mobiles - Draw and/or cut out pictures and/or shapes of clouds, rain drops, snowballs, snowflakes, sleet, hail, etc. Attach one end of length of thread to each item. Attach other end to wire. Hang in area with slight breeze and where others will see.

materials - wire coat hangers, or sticks (varying from 6" - 12" lengths), heavy thread or string, magazines with appropriate pictures, scissors, construction paper, paste, crayons, paints or colored pencils, stiff paper or cardboard.

Sample:



13) Simple Thermometer - Fill a bottle 1/2 full of water. Add food coloring or ink. Carefully push a glass tube through hole in the stopper. Place stopper in the bottle. Adjust glass tube so it is in the water. Place bottle in the sun or on a radiator. Observe. Try placing in different areas - shade, refrigerator, floor, school yard, in a tree, etc.

materials - bottle about 6" high, glass tubing about 8" long, rubber stopper with hole (size to allow glass tube to pass through), food coloring or ink.

II. A.

5. Activities (con't.)

14) Weight of Air - Place an empty glass milk bottle or quart jar in refrigerator for about 10 minutes. Place a 2nd bottle in a pan of very hot water. Light one end of a piece of thick, fuzzy cord and drop cord into the cold bottle. Place the warm bottle upside down on top of the cold bottle. Where does the smoke go? Now turn the bottles upside down. Where is the smoke? Discuss weights of warm and cool air.

materials - 2 empty glass milk bottles or quart jars, matches, about 6" thick, fuzzy cord, very hot water, pan, use of refrigerator.

15) Evaporation - (a) Put a tablespoon of water into each of two saucers. Place one in a sunny spot and the other in a shady spot. Observe in one hour. Try in other areas. (b) Put some loose soil in shallow dish and add water to fill dish. Place in sun one to two days. Observe. Compare with the ground drying (or grapes, leaves, clay bricks or skin drying, etc.).

materials - 2 saucers, tablespoon, water, sunny spot, shady spot, loose soil, shallow dish.

16) Condensation - Place a glass or pitcher filled with ice and water in the sun or in a warm spot; stir. Observe the outside of the container. Discuss warm particles of air meeting cold, getting thicker and joining to make a liquid. Observe basement pipes - warm and cold water. How does water come from air? (rain, hail, sleet, snow, fog, dew, frost). Observe spider webs in early A.M., also grass blades and leaves. What about when it's below freezing? Cloudy nights as compared to clear nights?

materials - glass or aluminum pitcher, ice, water, sun or warm spot, spider webs.

17) Frost - Put a large handful of ice cubes in a can and cover them with water. Add a little salt and stir for about four minutes. Observe the outside of the can.

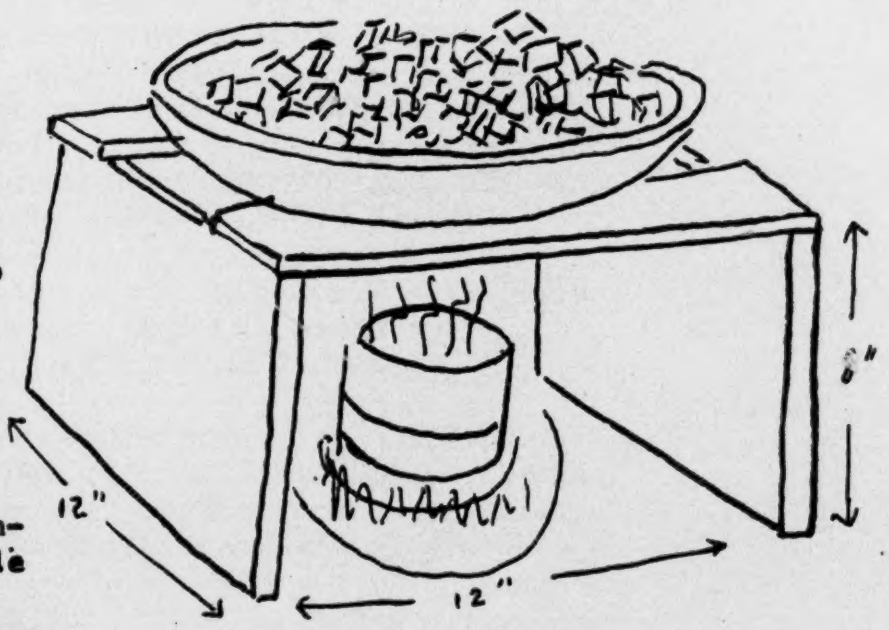
materials - large fruit can (#5), ice water, stirring stick.

18) Rain Gauge - Fill glass about ½ full of water. Fasten ruler to outside of glass with tape. The bottom of the ruler should reach the water, but no farther. (It should not touch the table.) Place outdoors away from buildings and trees. Observe amount of rain. Compare with other areas through newspapers, weather stations, etc. Keep a chart.

materials - glass or clear plastic drinking glass, 6" ruler, tape, water, pencil, paper.

5. Activities (con't.)

19) Rain - Fill a can 1/2 full of water and put it on a burner. Put a stand over it. Put some ice cubes and cold water in an aluminum pie plate. Put the pie plate on top of the stand. Boil the water. Observe the water vapor raising. What happens when the warm vapor reaches the under side of the cold pie plate? Discuss moisture accumulating around dust particles, joining to make bigger drops of water.



materials - water, empty tin can (4-5" high), wood stand about 4" higher than can (must fit outside the burner), 2 wide boards 8" high, 2 narrow strips 12" long, nails, hammer, pan for ice, ice cubes, burner.

20) Making a Cloud - Pour about 1" very hot water into large glass jar. Place a metal tray of ice cubes on top of the jar. Take the jar into a dark room or large closet. Shine a flashlight through the middle of the jar. Observe a small cloud. What else is observed? - (rain drops?) Discuss what is happening. Observe fog (clouds) over a pond or lake in the A.M.

materials - very hot water, large glass jar, metal tray, ice cubes, dark room, flashlight.

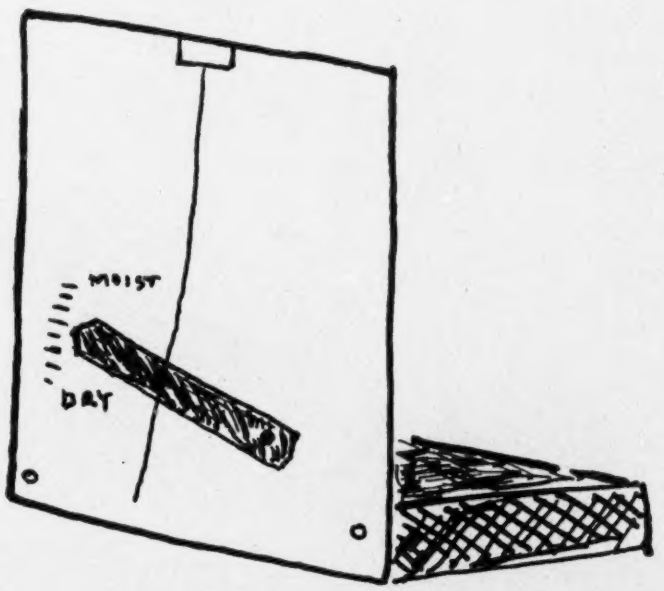
21) How to Judge Wind Velocity - Please see appendices for Beaufort Wind Scale. Keep a record for several days or weeks.

5. Activities (con't.)

22) Humidity - Tack pieces of cardboard on the edge of a block of wood so that it will stand up straight. Pin a red arrow to the cardboard on one of the bottom edges. The hole in the arrow should be larger than the pin in order for the arrow to move freely. Get one human hair about 8" long (ask permission first!) Fasten one end of hair to the top of the cardboard with tape. Tape the other end to the middle of the arrow. The hair should be stretched tight. Put a pencil mark on the cardboard at the point of the arrow. Write the word DRY beside the mark. Watch the instrument every day for a week or so. When the arrow moves up, put more pencil marks opposite the point. Write the word MOIST above the highest mark. Chart. Observe what's happening to the air. Discuss hot and cold weather and humidity.

materials - cardboard 8" x 10", tacks, block of wood, cardboard or stiff paper for 4" long arrow (use red construction paper or color white paper with felt marker or crayon), pin, 8" hair, tape, pencil or felt marker, paper for chart.

Sample:



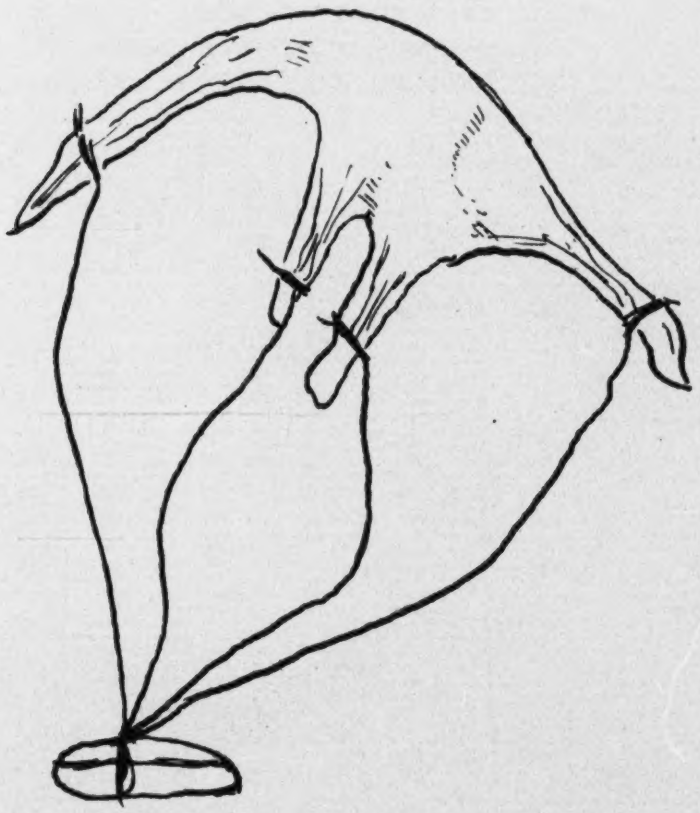
5. Activities (con't.)

23) Air Activity - Parachute - make from large handkerchief or bandanna. Tie pine cone, acorn, sticks or similar object to strings as in sketch.

Throw in air in school yard - observe.
Let go out 2nd story window or from a tree - observe wind currents.
Throw in air in open field, from hilltop - observe.
How far does it go? Which direction?

materials - handkerchief or bandanna, pine cone, acorn, sticks, string.

Sample:



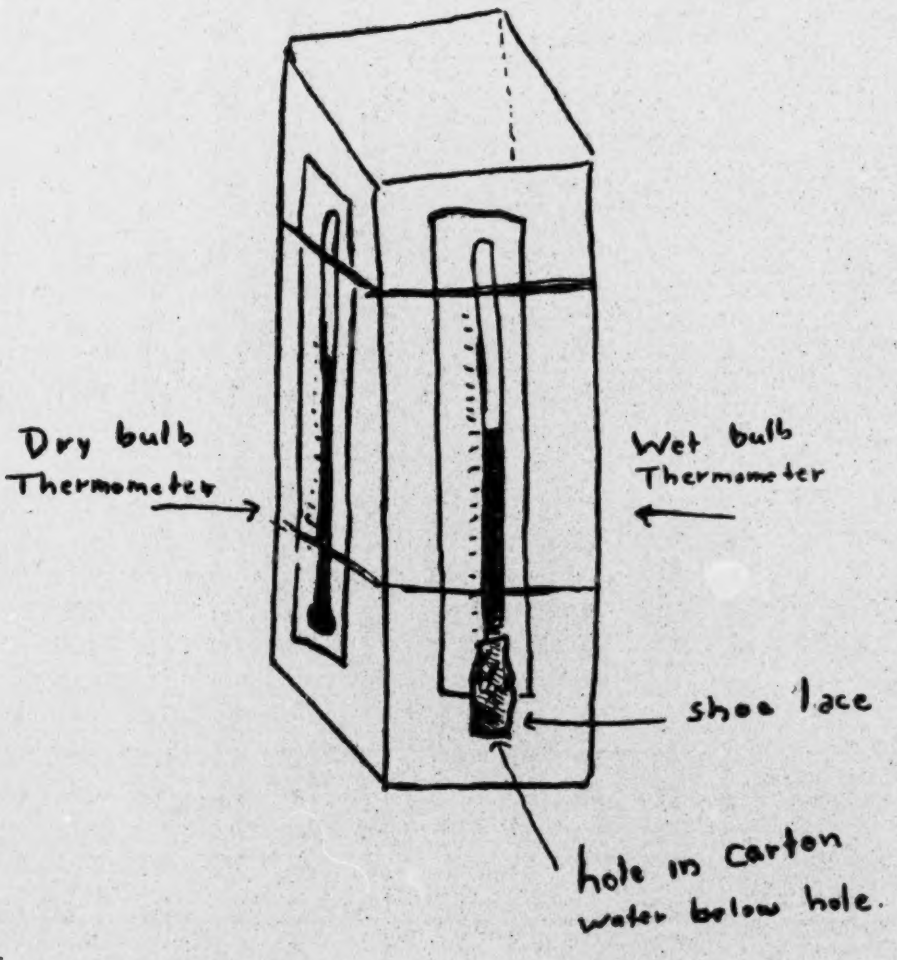
5. Activities (con't.)

24) Psychrometer (The amount of water vapor in the air compared to the maximum air can hold - relative humidity). - Cut off the end bulb guard from one thermometer. Cut off the tips of a shoe lace and slip shoe lace over bulb. Tie it in place with thread. Make a hole 1 inch up from bottom of milk carton and insert other end of shoe string. Use rubber bands to hold thermometer in place. Place 1/2" water in bottom of carton.

Keep records at specific times daily. Compare. Use with other weather instruments to make forecasts to class, school, etc.

materials - 2 (inexpensive) thermometers, shoe lace (6"), thread (or string), scissors, water, 2 rubber bands, 1 quart milk carton, Psychrometer table.

Sample:



5. Activities (con't.)

PSYCHROMETRIC TABLE--RELATIVE HUMIDITY IN PERCENT

Dry Bulb Temperature in °F.	Difference Between Dry and Wet Bulb Temperatures														
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20
32	89	79	69	59	49	39	30	20	11	2	-	-	-	-	-
34	90	81	71	62	52	43	34	25	16	8	-	-	-	-	-
36	91	82	73	64	55	46	38	29	21	13	-	-	-	-	-
38	91	83	75	66	58	50	42	33	25	17	2	-	-	-	-
40	92	83	75	68	60	52	45	37	29	22	7	-	-	-	-
42	92	85	77	69	62	55	47	40	33	26	12	-	-	-	-
44	93	85	78	71	63	56	49	43	36	30	16	4	-	-	-
46	93	86	79	72	65	58	52	45	49	32	20	8	-	-	-
48	93	86	79	73	66	60	54	47	41	35	25	14	3	-	-
50	93	87	80	74	67	61	55	48	43	38	27	16	5	-	-
52	94	87	81	75	69	63	57	51	46	40	29	19	9	-	-
54	94	88	82	76	70	64	59	53	48	42	32	22	12	3	-
56	94	88	82	76	71	65	60	55	50	44	34	25	16	7	-
58	94	88	83	77	72	66	61	56	51	46	37	27	18	10	-
60	94	89	83	78	73	68	63	58	53	48	39	30	21	13	5
62	94	89	84	79	74	69	64	59	54	50	41	32	24	16	8
64	95	90	84	79	74	70	65	60	56	51	43	34	26	18	11
66	95	90	85	80	75	71	66	61	57	53	44	36	29	21	14
68	95	90	85	80	76	71	67	72	58	54	46	38	31	23	16
70	95	90	86	81	77	72	68	64	59	55	48	40	33	25	19
72	95	91	86	82	77	73	69	65	61	57	49	42	34	28	21
74	95	91	86	82	78	74	69	65	61	58	50	43	36	29	23
76	96	91	87	82	78	74	70	66	62	59	51	44	38	31	25
78	96	91	87	83	79	75	71	67	63	60	53	46	39	33	27
80	96	91	87	83	79	75	72	68	64	61	54	47	41	35	29
82	96	92	88	84	80	76	72	69	65	61	55	48	42	36	30
84	96	92	88	84	80	76	73	69	66	62	56	49	43	37	32
86	96	92	88	84	81	77	73	70	66	63	57	50	44	39	33
88	96	92	88	85	81	77	74	70	67	64	57	51	46	40	35
90	96	92	89	85	81	78	74	71	68	65	58	52	47	41	36
92	96	92	89	85	82	78	75	72	68	65	59	53	48	42	37
94	96	93	89	85	82	79	75	72	69	66	60	54	49	43	38
96	96	93	89	86	82	79	76	73	69	66	61	55	50	44	39
98	96	93	89	86	83	79	76	73	70	67	61	56	50	45	40
100	96	93	89	86	83	80	77	73	70	68	62	56	51	46	41

5. Activities (con't.)

c. Materials and Definitions

Vocabulary - Use activity and discussion words. While precise definitions are not needed, students should be able to understand weather terms and various descriptions of air. ie. fog, smog, humidity, etc.

Materials - Teacher should have, either in the class room or out-of-doors, readily available samples or pictures of a variety of forms of air, and simple instruments to measure air.

Other materials vary according to which activities the teacher chooses. A materials list follows each activity explanation.

d. Time and Place

Any time - try same activities at different times of a particular day, or different temperatures or air conditions, or different seasons.

Place - Some activities may be done in a natural setting and some in the classroom. It would be advisable if the teacher would use both settings.

Length - It is suggested that the teacher carry out these activities over a period of several days or weeks and that the maximum length of any one day's activities be no longer than one hour.

6. Related Curriculum Activities

As mentioned in the Introduction, outdoor education is not just another curriculum, it is largely a method in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

a. Physical Education - Have students pretend they are a leaf floating from a tree - no breeze, slight breeze, breeze, wind, gale, rain, hail, snow, etc. Pretend you are rain, snow, hail, etc. Pretend you are a cloud moving, changing.

b. Recreation - Make simple weather instruments at home (or school and take home) and use there (at home). Compare with school. Make and fly kites. (Refer to appendices for directions.)

c. Music - Be creative - make music, songs, about weather, imitating weather; sing songs about weather - about different seasons, etc.

d. Art - Create! Sketch cloud formations. Make a mural of a calm before the storm, the storm, aftermath and clean-up.

II. A

7. Evaluations

(Check appendices for sample instruments)

a. Check list
b. Fill-In, Drawing, Sketching, Writing, Etc.
c. Objective
d. Subjective
e. Teacher Comments on Behavior
f. Verbal Test of Students Knowledge

8. Suggested Further Activities

a. Continue with Mini-exploration guides.

b. Repeat same activities covered, only in different areas (parks, home, playground, etc.); try in different seasons and different times of day. Discuss, compare.

c. Have students carry out simple activities at home - temperature at 8 P.M. and 8 A.M., moon shape, odors noted, etc.

d. Carry out activities not already carried out.

e. Add similar activities and/or change activities for repeating concepts.

f. Encourage the FUN aspects of exploring and observing.

g. Encourage students to do similar activities on their own, with friends, and/or family.

h. Keep records of a specific area - changes day to day; week to week or different seasons.

9. Resources

The following listing will be updated as additional materials are received and/or reviewed by the Handicapped Children's Nature Study Center. In addition please consult the appendices and the I.M.C. book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available from the H.C.N.S.C.

9. Resources (con't.)

a. BOOKS

Air
Preston, Edna M.
Follett, Chicago, 1965

Air Is All Around Us
Branley, Franklin M.
Crowell, New York, 1962

Everyday Weather and How It Works
Schneides, Herman
Whittlesay House
A Division of McGraw-Hill Book Company, Inc.
New York, 189 pp., $3.00

First Book of Air, The
Knight, David C.
Franklin Watts, Inc.
575 Lexington Avenue
New York 22, New York
1961, 69 pp.

Guest Weathercasting
The Dial Press Inc.
461 Park Avenue, South
New York, New York 10016

Kites-How to Make and Fly Them
Downer, Marion
Lothrop, $3.35

Let's Find Out What's In the Sky
Schaap, Martha and Charles

Weather Experiments, Jr. Science Book of
Feravolo, Rocco V.
Garrard Publising Company
Champaign, Illinois, 1963, 64 pp.

b. CHARTS, POSTERS, FLASHCARDS

* Society of Visual Education Inc.
1345 Diversey Parkway
Chicago, Illinois

"Familiar Cloud Forms" (and other picture-story study print sets)

c. FILMS, FILM-STRIPS, SLIDES

"Air All Around Us", color, b/w, 11 min.
McGraw-Hill Text Films
330 W. 42nd Street
New York, New York 10018

9. Resources (con't.)

"Air and What It Does", color, 11 min.
Encyclopedia Britanica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

"Rainshower", 14½ min., color, With teacher's Guide
Dimersian Films
662 N. Robertson
Los Angeles, California

"The Land and the Bluebells", Film-strip
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

"The Meaning of Conservation", Film-strip
McGraw-Hill Text Films
330 W. 42nd Street
New York, New York 10018

"The Muddy Raindrops", Film-strip
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

"Wind and What It Does", color, 11 min.
Encyclopedia Britanica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

d. MAGAZINES

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The
State of New York Conservation Department
Albany, New York

National Geographic
National Geographic Society
Washington, D. C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D. C. 20036

9. Resources (con't.)

Nature and Science
Published for the American Museum of Natural History
by the Natural History Press
A Division of Doubleday & Company, Inc.
Garden City, New York 11530

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D. C. 20036

e. PAMPHLETS, BOOKLETS

* "The Soil That Went to Town"
AIB 95, 15¢
Local Soil Conservation Office

* "Iowa Tornadoes"
Iowa Mutual Tornado Insurance Company
Hubbell Building
Des Moines, Iowa 50308

* "Snow and Ice", "Weather"
Cornell Science Leaflets
New York State College of Agriculture
Cornell University
Ithoca, New York

f. PHONOGRAPH RECORDINGS

"Weather Songs" MR 0322
Motivation Records
(Word sheets included)

B. SOIL

1. Aim

To begin to explore one component of our total environment through our senses.

2. Purpose

Presumably, by now the students have begun to become sensitive to their environment by having practiced observing with all their senses. In order for them to understand their environment in its totality, they should begin to use their powers of observation on each of the individual components of the environment.

Students need to use their senses in exploring environments not only in the Handicapped Children's Nature Study Center and in their classrooms but, almost more importantly, they need to continue their sense observations and mini-explorations with their families and friends as they grow and experience <u>outside</u> their school activities.

3. Educational Objectives

a. Each student should see soils of different colors or shades (red, brown, black, yellow.)

b. Each student should feel soils of different textures (fine, coarse, rough, wet, dry.)

c. Each student should experiment with soil to see how it can be moved by water.

d. Each student should experiment to see how soil is moved by air.

e. Each student should experiment with different soil temperatures.

f. Each student should try to make some soil from rocks.

g. Each student should observe how plants may become soil.

h. Each student should look through soil to find creatures living in it.

4. Concepts

a. The material in which things live is called soil. (Dirt is something we wash off our hands and faces because we don't want it and it is not healthful.)

b. Soil is necessary to life.

c. Soil is found wherever there are plants and animals.

d. Plants and animals need soil in order to live.

e. Soil can be moved by wind and water.

f. Soil is made up of many colors and shades.

g. Soil may be hard, soft, fine, coarse, heavy, light, etc.

5. Activities

a. Suggested Lead-Up Activities

1) Carry out Guide I and Guide II. A. of Unit II.

2) Discuss the particular activities your group is going to carry out - methods, materials and behaviors in the out-of-doors.

3) Discuss the word soil. Explain that things grow in soil. Dirt is what you wash off your hands.

4) Look through books, pamphlets, magazines, etc. for varieties of soil.

5) View films, film-strips, and/or slides of different soils.

b. Activity Procedures

The following activities are all related to understanding the properties of soil. It is suggested that the teacher choose the activities which are most practical and feasible for her particular students. Ideal group size is 6-8. Groups larger than that should have an aide so that no leader is responsible for more than 8 and preferably no more than 6 students. This enables all in one group to observe an item together.

Activities with soil will include:

1) Activities with moving soil - wet and dry
2) Activities with soils of different colors
3) Activities with soils of different textures and sizes
4) Activities with material which is becoming soil
5) Activities with the temperature of soils
6) Activities with many soils

1) Activities with Moving Soil - wet and dry

a) Splash Erosion - Place some soil in a lid or saucer and put in the middle of a sheet of white paper. Using medicine dropper, release a few drops of "rain" from a height of several feet above onto the soil. Observe. What has happened to the paper? From where did the soil drops come? Now place some blades of grass over the soil and release some drops of "rain" as before. Observe. Compare.

materials - jar or plastic container lid or saucer, medicine dropper, soil, blades of grass, 2 sheets white paper.

b) Splash Erosion - Paint boards white or tack strips of blotting paper on each board. Make marks (starting 6" up from point) every 1 inch. Nail a piece of tin as a protecting roof to the unpainted end of each board. Put one board 6" into grass area, the other 6" into plain soil area. After a rain, compare the amount of soil splashed onto each board and the height the splashes reached. Or, using a sprinkling can, sprinkle same amout of water about 4 feet over each board. Then compare the splashes.

materials - 2 pieces of ½ inch wood, 4" wide, 18" long, pointed at one end, white paint and/or blotting paper and tacks, indelible felt marking pen, ruler, 2 pieces of tin 4" x 6"; or, sprinkling can and water.

c) Water Erosion - Place an ice cube in a pile of sand. Watch the water erode the soil. Have students make dams to hold back the water.

materials - sand, box for sand, ice cubes.

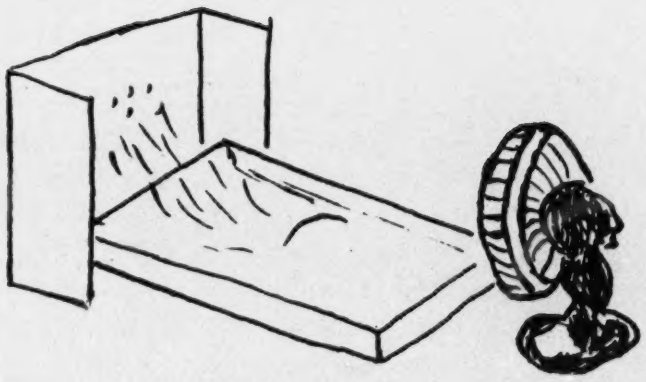
d) In the out-of-doors have students look for places where soil has been moved by the wind (rain, animals, man). Look for places where people and/or animals have made it easier for the wind and rain to move soil. Can your students find things people have done which make it harder for wind and rain to move soil?

e) Wet sand pillars - Your students can let very wet sand drip from their fists. Let each see how high a pillar he can build. Have your students see how deep a hole they can dig in the sand. See who can build the steepest walls, tunnels, bridges, canals, etc.

materials - sand, water.

5. Activities (con't.)

f) Erosion by Wind - Place dry sand in a box or cardboard carton and allow an electric fan to blow over it. (Try different speeds.) Do same with gravel, larger pebbles. Put an obstacle such as a large pebble, leaves, stick, grass, or small rock in the sand. Ask questions such as: Is any pile changing? What is causing the change? Where is the sand going? What would happen if the high end of the box were cut off? Is more sand moved with faster or slower wind? Which size sand gets moved the farthest? With a rock in the sand pile - how does this change where the sand is blown?



materials - electric fan,
extension cord,
cardboard carton or box as in illustration, sand, pebbles, small rocks, sticks of different sizes and shapes.

2) Activities with soils of different colors

a) Rainbow Hunt - Walk around the school yard and neighborhood. See how many kinds of soil and colors of soil you can observe. Use your senses of sight and feeling.

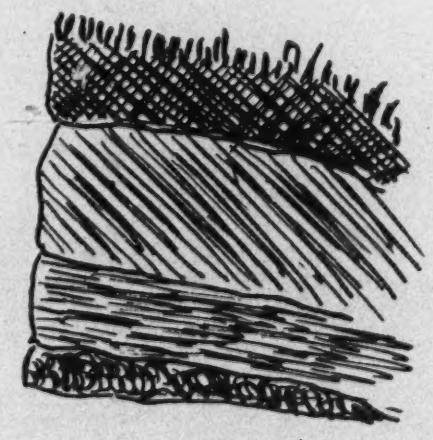
b) Collect as many colored soils as possible in plastic sandwich bags. (Small amounts). Make a "soil design" in the cover of a shoe box.

materials - plastic sandwich bags, trowel, shoe box cover.

c) Dig a hole and draw a sketch of the soil layers and colors.

materials - shovel, paper, crayons.

d) Sand Painting - Sketch pictures of an outdoor sceen or design on plywood. Paint layer of mucilage over area to be covered with one color or sand. Best to paint areas in large sections. Gently shake sieved sand over the mucilage area. Gently shake off excess sand and allow to dry. Later, add another layer of mucilage and sand as several layers help give depth to the painting. Allow each area to dry, preferably, in the sun, before repeating the process in another area.



5. Activities (con't.)

materials - different colors of sand or use powdered tempera paints, berry juices, or food coloring mixed well with sand with fingers, (coal dust makes black), tea or similar strainer, mucilage, 4-ply posterboard or smooth wood.

3) Activities with soils of different textures and sizes

a) Collect as many soils as possible. Feel each soil. Sort in size and texture order. Describe texture of each orally, or by a sketch, or by writing short sentences.

b) Soil Particle Size - With jar 2/3 full of water add some soil and cover. Agitate the jar. Let the contents settle. With the white paper behind the jar - mark the distinctive soil layers. Observe where the different sized grains are. Are the top pebbles or grains larger or smaller than the bottom ones?

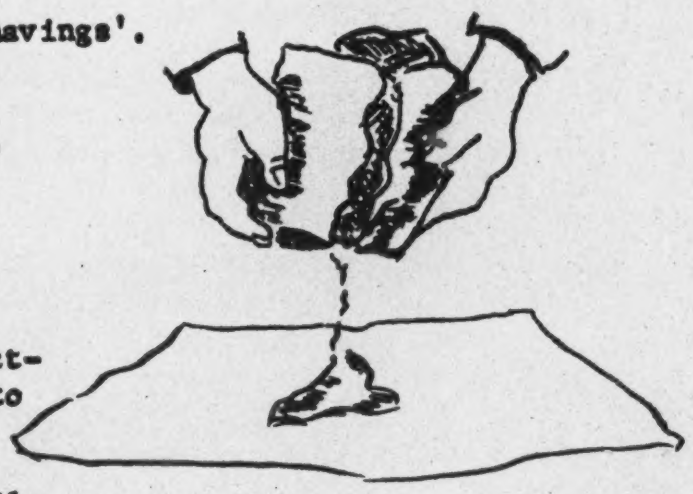
4) Activities with material which is becoming soil

a) Making soil - (1) - Have students rub two rocks together to see if small dust particles will come off.

materials - various types of rocks, (soft and hard), paper, bag or box to catch 'shavings'.

b) Making soil - (2) - Have students collect a handful of large pebbles. Put them in an old sock. Hit with a hammer.

materials - light weight hammers, large pebbles, old socks, hard non-destructible surface on which to pound.



5) Activities with the temperature of soils

a) With a thermometer, take the soil temperature by leaving the thermometer for 3 minutes:

1. On top of the ground in the sun
2. On top of the ground in the shade

5. Activities (con't.)

3. In the bottom of a 1' deep hole
4. In the soil in the side of the hole
5. In the soil which has grass growing in it
6. In the soil which has nothing growing in it.

Where is it warmest? Coolest? Is the soil the same temperature as the air? Make a chart showing a picture of each place you tested the temperature and write the temperature beside each place. Compare the temperatures.

materials - thermometer, paper, pencil

6) Activities with many soils

a) You're It - Draw a large circle and divide it into eight or more sections. In each section write instructions such as:

Find a round pebble.
Find some sand.
Find a teaspoon of clay.
Find a bit of topsoil.
Find a pebble that sparkles.

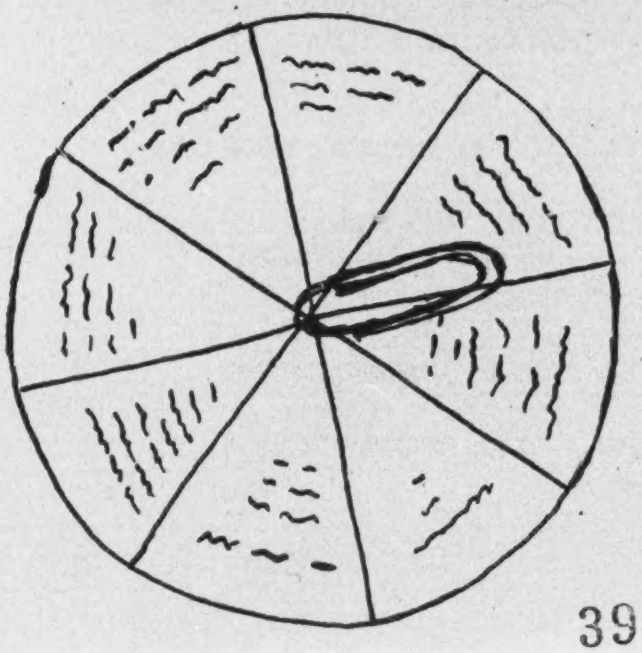
Or, sketch or paste pictures of requested resource. Gear the questions to your curriculum, students and available resources. (Maybe your students can give you some suggestions. Try to get your students to make up instructions.)

Push a straight pin into the middle of this circle, with a paper clip over it. Have each player take a turn spinning the paper clip. He follows the instructions in the section into which the paper clip points.

If natural resources aren't available or you don't want them brought back - use book and magazine pictures or have students note location, description or sketch. Or, have samples on a table and point to correct one.

materials - large paper or posterboard, compass (or draw by hand), pencil, natural soils according to instructions or book and magazines, straight pin, paperclip.

Sample:



5. Activities (con't.)

b) Earthworms and Soil Improvement - Put three layers of alternate dark and light soils in each of two jars. Put an earthworm on the top layer of one jar. Wrap the dark paper around both jars. Set aside. After a few days remove the papers and ask the students what they observe. Repeat process every few days until the earthworm soil is thoroughly mixed. Ask questions such as: In what way does the earthworm contribute to the fertility of the soil? How does it eat? What does it eat? How do earthworms move? What is on top of the soil in the earthworm jar?

materials - 2 wide mouthed jars and lids per group or 2 per student (better), dark soil with leaf mold, sandy soil, earthworms, dark paper.

c) What lives in soil? Dig a square foot of soil. Examine for worms grubs, ants, roots, etc.

materials - small shovels or trowels, paper or cardboard on which to examine soil.

c. Materials and Definitions

Vocabulary - Use activity and discussion words (clay, soil, gravel, sand, mud, topsoil, rock, etc.). While precise definitions are not needed, students should be able to distinguish among the above soil forms.

Materials - Teacher should have, either in the classroom or out-of-doors, readily available samples of a variety of soils. (sand, gravel, pebbles, mud, topsoil, clay and soils of varying shades and colors.)

Other materials vary according to which activities the teacher chooses. A materials list follows each activity explanation.

d. Time and Place

Any time - Try the same activities at different times of a particular day or at different temperatures or air conditions, or in different seasons.

Place - Some activities may be done in a natural setting and some in the classroom. It would be advisable if the teacher would use both settings.

Length - It is suggested that the teacher carry out these activities over a period of several days or weeks and that the maximum length of any one day's activities be no longer than one hour.

6. Related Curriculum Activities

As mentioned in the Introduction, Outdoor Education is not just another curriculum, it is largely a method in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

6. Related Curriculum Activities (con't.)

a. Recreation - Collect pebbles or rocks of different colors, sizes, shapes, textures - discuss, observe, review; skip pebbles (under guidance); construct mud pies, etc.

1) Stick Around - Each student holds several pebbles in one palm tosses them in the air catching as many as he can on the back of his hand (or in the palm). Toss those caught in the air again and catch as many as possible in the palm. Odd numbers caught get 1 point. Even number or none caught may lose his turn or get a zero score. Final score may be 7, (11 or 15).

2) Treasure and/or Scavenger Hunts - Make up lists of different soils (sizes, textures, and colors) to be brought back or located, for each small group with a teacher aide. Or, have clues in each area to follow.

3) Observation Lotto - Write or picture things to look for (either out-of-doors or in books and magazines and terraria) on card or sheet of paper. Have individuals or small groups fill in their card as in bingo or lotto. Continue until all spaces are filled on their cards.

materials - cards or sheets of paper, pencil or something from nature to mark appropiate square, stick, grass.

Sample:

CLAY	LEAF MOLD	DRY SAND
GRAVEL	BLACK PEBBLE	YELLOW SOIL
FINE WHITE SAND	ROUND PEBBLE	BLACK SOIL

4) Collecting - Have students in small groups with teacher aide walk in the out-of-doors, perhaps several different types of areas, looking for different pebbles and small rocks to collect (or just to observe) - colors, shades, sizes, shapes, textures. Each collect favorites - make up story, admire, paint, etc.

6. Related Curriculum Activities (con't.)

5) Treasure Walk - Each small group of students with a teacher aide walks through a small outdoor area. Each student looks for his own special soil treasure - something he thinks looks pretty, smells pleasant or reminds him of something nice. Do not touch or pick up the object, Get the picture in your mind (shape of a rock, the colors of soil, the smell of leaf mold, etc.) Later share with others by telling, sketching, drawing, singing, pantomine, etc.

materials - memory, pencil, crayons, chalk, etc.

6) Quests - Each small group of students and teacher aide has a list of discoveries to look for on the walk, hike or trip. Names of things aren't as important as observing - things that look, feel, smell, hear - differently and similarly:

red, yellow, brown, black soil
big rocks down to pebbles
smooth to rough, sharp pebbles, or rocks
clay, sand, top soil
wet and dry soil samples

7. Evaluations

(Check appendix for sample instruments)

a. Check list
b. Fill-In, Drawing, Sketching, Writing
c. Objective
d. Subjective
e. Teacher Comments on Behavior
f. Verbal Tests of Students Knowledge

8. Suggested Further Activities

a. Compare rocks, pebbles, gravel, sand - sizes, shapes, colors, textures, etc.

b. Discuss possible uses of different soils - by nature and by man.

c. Discuss possibilities of other fun activities with soils.

d. Repeat same activities covered, only in different areas (park, home, playground). Compare, discuss.

e. Carry out activities not already carried out.

f. Add similar activities and/or change activities for repeating concepts.

g. Continue with Mini-Exploration Guides.

h. Encourage students to do similar activities on their own, with friends and/or family.

8. Suggested Further Activities (con't.)

i. Encourage the FUN aspects of exploring and observing.

j. Keep records of specific area - changes day to day; or week to week, or different seasons - as to soils - temperature, colors, textures, movements, etc.

k. Compare run-off of terrace soil, mulched soil, bare soil.

9. Resources

The following listing will be updated as additional materials are received and/or reviewed by the Handicapped Children's Nature Study Center. In addition please consult the appendix and the I.M.C. book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available at or through the H.C.N.S.C.

a. BOOKS

About the Land, The Rain and Us
Shannon, Terry
Children's Press
Chicago, Illinois 1963

True Book of Conservation, The
Gates, Richard

Down the Mountain
Bartlett, Margaret F.
Scott, New York 1963
IMC #11781 (PI) 551.3

What is Soil?
Syrocki, B. John
Benefic Press, Chicago 1961
IMC *11883 (P) 631.4

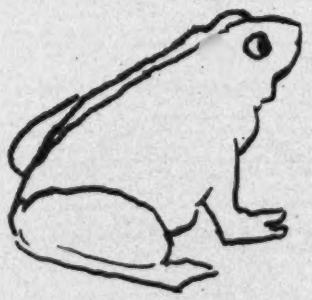
To Save the Soil
Talley, Naomi
Dial Press, New York 1965
IM C #12180 (I) 631.4

b. CHARTS, POSTERS, FLASHCARDS

Soil Conservation Service
contact your local district OR
U.S. Department of Agriculture
Washington, D.C.

"Conservation and Full Utilization of Water" and other titles
U. S. Department of Interior
Bureau of Reclamation
Washington, D. C. 1966

* "Conservation Chart"
U.S. Department of the Interior
Washington, D. C. 20240



II. B.

9. Resources (con't.)

c. FILMS, FILM STRIPS, SLIDES

Finding Out About Rocks, color, 14 minutes
United World Films
221 Park Ave. South
New York, New York 10003

National Grassland, The
Forest Service
U.S. Department of Agriculture
Washington, D.C. 20250

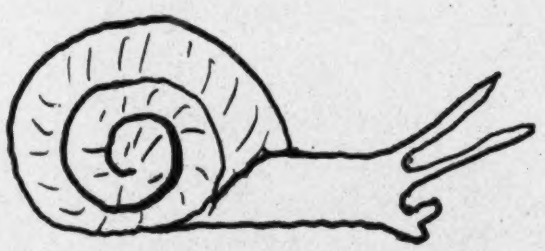
Rocks: Where They Come From, color, b/w, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Soil and Life, The, color, 14 minutes
United World Films
221 Park Avenue South
New York, New York 10003

Iowa State Conservation Commission
Check local district for titles of films and slides

Iowa Soil Conservation Commission
Check local district for film and slide titles

d. MAGAZINES



* Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The
State of New York
Department of Environmental Conservation
Albany, New York 12201

National Geographic
National Geographic Society
Washington, D.C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

II. B.

9. Resources (con't.)

Nature & Science
published for the American Museum of Natural History
by The Natural History Press
A Division of Doubleday & Company, Inc.
Garden City, New York 11530

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

e. PAMPHLETS, BOOKLETS

* "The Soil That Went to Town"
AIB 95, 15¢
and numerous other titles
Local Soil Conservation Office

"Early American Soil Conservationists"
Miscellaneous Publication No. 449
and numerous other titles
Soil Conservation Service
U.S. Department of Agriculture
Washington, D.C.

OR Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

* "Help Keep Our Land Beautiful"
* "The Story of Land"
* "Food and The Land"
* "Making A Home for Wildlife on the Land"

Soil Conservation Society of America
715 N.E. Ankeny Road
Ankeny, Iowa 50021
25¢ each

* "Soil and Water"
pamphlet 442, November, 1968
and numerous other titles

Iowa State University of Science and Technology
Cooperative Extension Service
Ames, Iowa

"Soil Means Life"
1969, 10¢ each

National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

Please check the appendix for further resources.

II. GUIDES BY COMPONENTS OF OUR ENVIRONMENT

C. WATER

1. Aim

   To begin to explore one component of our total environment through our senses.

2. Purpose

   Presumably, by now the students have begun to become sensitive to their environment by having practiced observing with all their senses. In order for them to understand their environment in its totality, they should begin to use their powers of observation on each of the individual components of the environment.

   Students need to use their senses in exploring environments not only in the Handicapped Children's Nature Study Center and in their classrooms but, almost more importantly, they need to continue their sense observations and mini-explorations with their families and friends as they grow and experience outside their school activities.

3. Educational Objectives

   a. Each student should observe water in several forms (ice, rain, tap water, pond water, steam).

   b. Each student should observe clean water and polluted water.

   c. Each student should observe the action of moving water.

   d. Each student should participate in an activity using water.

4. Concepts

   a. Clean water is necessary for life.

   b. The form of water may be changed (snow to rain, liquid to ice).

   c. Moving water has much force.

4. Concepts (con't.)

   d. Water can carry objects.

   e. Clean water is colorless and odorless.

   f. Clean water is needed for recreation.

5. Activities

   a. Suggested Lead-Up Activities

      1) Carry out Guide I of Unit II and Guides II A., B., C., and D.

      2) Discuss the particular activities your group is going to carry out - methods, materials and behavior in the out-of-doors.

      3) Discuss the word water, liquid which falls in the form of rain or snow and forms ponds, rivers, oceans, etc.

      4) Look through books, pamphlets, magazines, etc. for pictures of water forms.

      5) View films, film-strips and/or slides of the ocean, waterfalls, etc.

   b. Activity Procedures

      The following activities are all related to understanding the properties of water. It is suggested that the teacher choose the activities which are most practical and feasible for her particular students. Ideal group size is 6-8. Groups larger than that should have an aide so that no leader is responsible for more than 8 and preferably no more than 6 students. This enables all in one group to observe an item together.

      1) Observation Lotto - Write or picture things to look for (either out-of-doors or in books and magazines and terraria) on card or paper. Have individual students or small groups and aide fill in their card as in bingo or lotto. Continue until all students fill in all spaces on their cards.

         materials - card or paper, pencil to mark or something from nature to mark appropriate square (stick, pebble, grass).

puddle	stream	ice
snow	fog	river
rain	pond	steam

5. Activities (con't.)

2) You're It - Draw a large circle and divide it into 8 or more sections. In each section write, sketch or paste pictures of forms of water to locate. Gear the instruction - questions to your curriculum, students, and available resources. Perhaps your students can give some suggestions for questions and/or instructions.

Push a straight pin into the middle of the circle and put a paper clip over it. Have each student take a turn spinning the paper clip. He follows the instructions in the section in which the paper clip points.

If natural forms of water aren't available or you don't care to have them brought back - use book and magazine pictures, or, have students note location, description or make a sketch, or have samples on a table and have students point to or pick up correct item.

materials - large paper or poster board, compass (or draw circle by hand), pencil, natural forms of water according to questions and instructions, or books and magazines, straight pin, paper clip.

Sample:

3) Sediment, etc. In Water - Have a group of students (or individuals) get a glass of water from a faucet and a glass of water from a pond. Let settle. Then observe, compare. Filter both. Why don't we taste the pond water? (Probably has germs or impurities in it.)

materials - glasses or glass jars, faucet water, pond water (or puddle, stream, river, etc.).

5. Activities (con't.)

4) Water vs. Ice or Snow Volumn -

a) Fill a jar or other container with snow, let it melt - measure the water obtained.

b) Fill a container with ice cubes, allow to melt. Measure the water obtained.

c) Boil water in a tea kettle. Observe what happens to the water - steam.

materials - jars or similar containers, tea kettle, ice cubes, snow, ruler.

5) Seed Growth and Water - Plant three seeds in each of three containers. Water (a) a little, (b) flood, and (c) don't water. Continue to water in this manner. Observe growth differences.

materials - seeds (beans), growing containers (waxed paper cups, aluminum foil containers, chicken pie pans, etc.).

6) Muddy Water - Put soil in a glass jar of water, shake, let settle. Observe different levels of settled soil.

materials - glass jar, water, different soils.

7) Pond Life - Use nets to dip out animal and plant life around a pond. How many of each can be found? How many that look alike are found? Or, bring large container of pond water into the classroom. Use nets to dip out small amount to observe, sort, count, etc.

materials - water dip nets (refer to appendix for directions), 5 gallon, 1 gallon or similar large clean containers, pond water.

8) Dams - Around a stream or in a sand box have students build dams out of rocks, sand, pebbles, sticks, mud, etc. Which holds best? How fast is the water going? (Pour water in sand box from hill.)

materials - stream or sand box, rocks, sand, pebbles, sticks, mud, water.

5. Activities (con't)

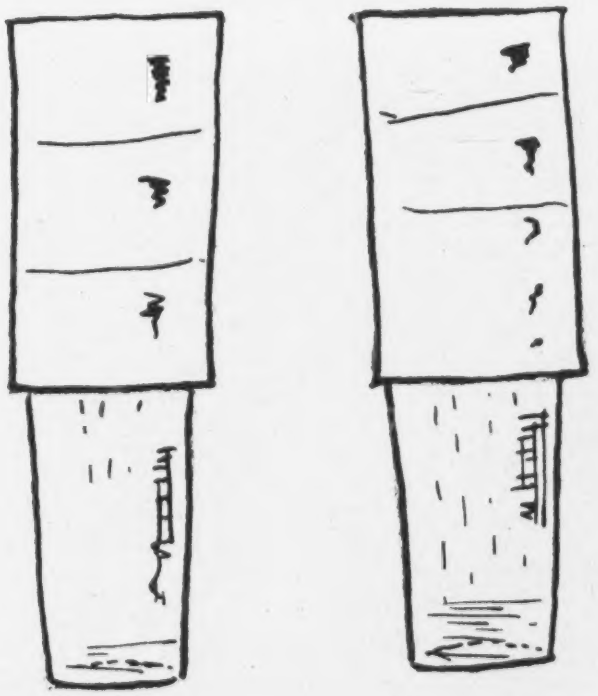
9) Evaporation - Put 2 teaspoons of water in each of 2 saucers. Place one in the shade and the other in the sun. Observe saucers next day. Which is dry?

materials - 2 saucers, water, teaspoon.

10) Water in the ground - Put about 10 holes close together in the bottom of each of two cans. Fill the cans with loose soil to about 2" from the top. Pack the soil tightly in one can, evenly all around. Put each can on top of a jar. All the nail holes must be over the mouth of the jar. Now, pour ½ glass of water into each can. Observe how the water drips through the loose dirt as compared to the packed. Try again with different soils.

materials - 2 fruit juice cans, nail, hammer, 2 glass jars with tops a little smaller than the cans, soil.

Sample:



11) Water table - Pour water slowly into a glass jar full of sand. Observe movement of water. Measure water level (top of water to top of sand). Add a little more water to the jar. Observe water table. What would happen if the water was pumped out?

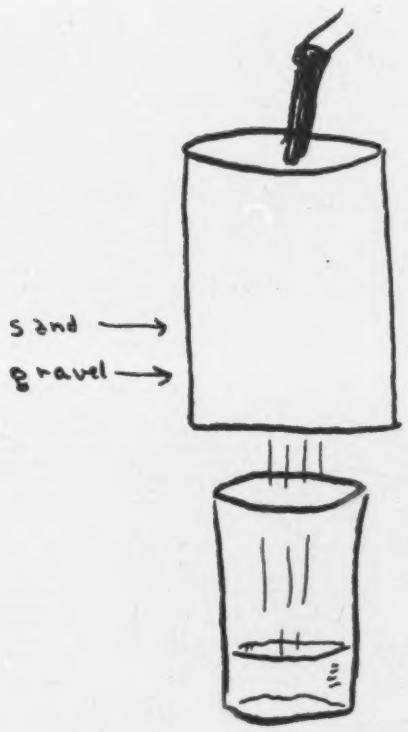
materials - water, sand, glass jar, ruler.

5. Activities (con't.)

12) Filtering Muddy Water (Model Filtering Plant) - Punch 6-8 small holes in the bottom of a can. Put some gravel in the bottom, then put about 4" of sand on top. Place the can on top of a drinking glass and pour in some muddy water. Observe the color of the water dripping into the glass. What about germs?

materials - 1 tall juice can, 2 cups gravel, 3 cups fine sand, 1 drinking glass, small nail, hammer.

Sample:



c. Materials and Definitions

Vocabulary - Use activity and discussion words (ice, snow, steam, liquid, etc.) While precise definitions are not needed, students should be able to distinguish among the above water forms.

Materials - Teacher should have, either in the classroom or out-of-doors, readily available samples of a variety of water (tap, pond, puddle, dew, etc.).

Other materials vary according to which activities the teacher chooses. A materials list follows each activity explanation.

d. Time and Place

Any time - Try same activities at different times of a particular day, or different temperatures or air conditions, or different seasons.

II. C.

5. Activities (con't.)

Place - Some activities may be done in a natural setting and some in the classroom. It would be advisable if the teacher would use both settings.

Length - It is suggested that the teacher carry out these activities over a period of several days or weeks and that the maxium length of any one day's activities be no longer than one hour.

6. Related Curriculum Activities

As mentioned in the Introduction, Outdoor Education is not just another curriculum, it is largely a method in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

a. Physical Education

1) Dig worms. Go fishing in nearby ponds and rivers.

2) Practice spin casting. Practice casting onto targets on dry land before casting into a pond.

3) Swim, wade; rowboat, canoe - in water or imitate on dry land.

4) Practice safety, life saving.

b. Recreation

1) Fishing - gather sticks for poles, attach string or line and hook on a safety pin with bait and GO FISHING! What can be caught in different types of water?

materials - 5'-8' sticks, 1" in diameter, string or line, small hook or a safety pin, bait - worms, cheese, bread crumbs, insects, grasshoppers, etc.

2) Sail Boat - (refer to appendix for boat directions) - Or, sail a leaf, twig, aluminum foil or small block of wood. Do this on a pond, puddle, stream, etc. Compare the differences of movement on waters of different sizes, amount of wind, size of boat, height of boat, sail or not, etc.

materials - leaf, twig, aluminum foil or 2"X3"X1" block of wood, pond, puddle, stream, etc.

3) Make flies out of feathers, yarns, hair and hooks. Then try using them as bait.

II. C.

6. Related Curriculum Activities (con't.)

4) Swim, water play - for fun - with family and/or friends.

5) Explore a stream, marsh, puddle, etc. for beauty or plant life or animal life.

c. Music

1) Listen to moving water - ocean, stream, spring, rain, river, lake, etc.

2) What other sounds can be heard around different waters?

3) Make sound recordings to go with a mural.

d. Art

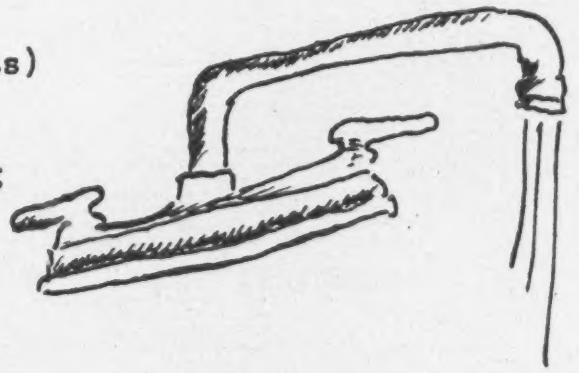
1) Sketch different forms of water.

2) Make a mural including as many different forms of water as possible.

3) Sketch or take pictures of reflections in standing water.

7. Evaluations
(check appendices for sample instruments)

a. Check list
b. Fill-In, Drawing, Sketching, Writing
c. Objective
d. Subjective
e. Teacher Comments on Behavior
f. Verbal Test of Students Knowledge



8. Suggested Further Activities

a. Repeat same activities covered, only in different areas (park, home, playground, etc.). Compare, discuss.

b. Carry out activities not already carried out.

c. Add similar activities and/or change activities for repeating concepts.

d. Continue with Mini-Exploration Guides.

e. Encourage the FUN aspects of exploring and observing.

II. C.

8. Suggested Further Activities (con't.)

f. Encourage students to do similar activities on their own, with friends, and/or family.

g. Keep records of a specific area - changes day to day; or week to week; or different seasons. Compare.

9. Resources

The following listing will be updated as additional materials are received and/or reviewed by the Handicapped Children's Nature Study Center. In addition please consult the appendices and the I.M.C. book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available from the H.C.N.S.C.

a. BOOKS

Clean Brook
Bartlett, M.F.
IMC #11416, (P)

Rain, Hail, Sleet and Snow, Jr. Science Book of
Larrick, Nancy
Garrod Publishing Co.
Champaign, Illinois
1961, 63 pp.

Water, Jr. Science Book of
Peterson, Ottis
Ganard
Scarsdale, New York
1966

Water All Around
Pine, Tillie S.
McGraw, Hill
New York
1959

Water Experiments, Jr. Science Book of
Ferarolo, Rocco V.
Garrod Publishing Co.
Champaign, Illinois
1965, 64 pp.

II. C.

9. Resources (con't.)

What is Water?
Hagamann, Adaline P.
Benefic Press
Chicago, Illinois
1960

b. CHARTS, POSTERS, FLASHCARDS

"Water", and other titles
Soil Conservation Service
U.S. Department of Agriculture
Washington, D.C.
OR Check your local district

c. FILMS, FILM-STRIPS, SLIDES

Adventures of Jr. Raindrop
Soil Conservation Service
U. S. Department of Agriculture
Washington, D.C.
or, your local district

OR Forest Service
U.S. Department of Agriculture
Washington, D.C.
or, your local region

I'm No Fool in Water
Walt Disney
color, 8 minutes

Rainshower
Churchill Films
6671 Sunset Blvd.
Los Angeles, California 90025

We Explore the Stream, color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Muddy Raindrop, The - Film-Strip
Society for Visual Education
1345 Diversey Parkway
Chicago, Illinois 60614

d. MAGAZINES

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

II. C.

9. Resources (con't.)

Conservationist, The
State of New York
Department of Environmental Conservation
Albany, New York 12201

National Geographic
National Geographic Society
Washington, D.C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

Nature & Science
published for the American Museum of Natural History
by the Natural History Press
A Division of Doubleday & Company, Inc.
Garden City, New York 11530

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

e. PAMPHLETS, BOOKLETS

Cornell Science Leaflets - several titles
New York State College of Agriculture
Cornell University
Ithaca, New York

"Water"
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036
10¢ each

"Showdown", "Mine Acids" & numerous other titles
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D.C. 20402

II. C.

9. Resources (con't.)

"Clean Water"
Izaak Walton League of America
1326 Waukegan Road
Glenview, Illinois 60025

"Will We Have Enough Water"
Humble Oil & Refining Company
Public Relations Department
P.O. Box 2180
Houston, Texas 77001

II. GUIDES BY COMPONENTS OF OUR ENVIRONMENT

D. PLANTS

1. Aim

   To begin to explore one component of our total environment through our senses.

2. Purpose

   Presumably, by now the students have begun to become sensitive to their environment by having practiced observing with all their senses. In order for them to understand their environment in its totality, they should begin to use their powers of observation on each of the individual components of the environment.

   Students need to use their senses in exploring environments not only in the Handicapped Children's Nature Study Center and in their classrooms but, almost more importantly, they need to continue their sense observations and mini-explorations with their families and friends as they grow and experience outside their school activities.

3. Educational Objectives

   a. Each student should observe plants of different sizes.

   b. Each student should observe plants of different shapes (moss, fern, grass, flower, shrub, tree).

   c. Each student should observe leaves of different shapes, sizes, textures.

   d. Each student should observe plants in winter condition.

   e. Each student should observe plants in the wild and under cultivation.

   f. Each student should use plants for a recreational activity.

4. Concepts

a. There are many kinds of plants.

b. There are many sizes of plants.

c. Most plants have green leaves.

d. Animals need plants for food.

e. Humans need plants for food.

f. Plants shield from the wind, rain, and sun.

5. Activities

a. Suggested Lead-Up Activities

1) Carry out Guide I and II A, B & C of Unit II.

2) Discuss the particular activities your group is going to carry out - methods, materials and behavior in the out-of-doors.

3) Discuss the word plant - A living being which does not move from place to place. It usually has green leaves and grows from roots.

4) Look through books, pamphlets, magazines, etc. for the different classes of plants.

5) View films, film-strips and/or slides of the various plants.

b. Activity Procedures

The following activities are all related to understanding the plants. It is suggested that the teacher choose the activities which are most practical and feasible for her particular students. Ideal group size is 6-8. Groups larger than that should have an aide so that no leader is responsible for more than 8 and preferably no more than 6 students. This enables all in one group to observe an item together.

1) You're It - Draw a large circle and divide it into 8 or more sections. In each section write, sketch or paste pictures of plants to locate. Gear the instruction - questions to your curriculum, students and available resources. (Perhaps your students can give some suggestions for questions and/or instructions.)

Push a straight pin into the middle of the circle and put a paper clip over it. Have each student take a turn spining

5. Activities (con't.)

the paper clip. He follows the instructions in the section in which the paper clip points.

If natural plants aren't available or you don't care to have them brought back - use book and magazine pictures, or have students note location, description or make a sketch, or have samples on a table and students point to or pick up correct item.

materials - large paper or poster board, compass (or draw circle by hand), pencil natural plants according to questions and instructions or books and magazines, straight pin, paper clip.

2) Mini-Gardens (Dish gardens) - In small groups with teacher aide gather materials. Put small pebbles or gravel on the bottom of the container, then sand, the woods soil with humus (leaf mold). On top students plant small plants and maybe small animals. Keep soil moist. Or, they can construct make-believe sciences with twigs, dried leaves, grasses, pebbles, flowers and bugs.

materials - aluminum pie tins or foil, gravel, sand, soil, humus, small plants, small animals, twigs, grasses, leaves, flowers, bugs, water.

5. Activities (con't.)

3) Scavenger and/or Treasure Hunts - Make up lists of different plants to be brought back or just located and observed, for each small group with teacher aide. Or, have clues posted in each area and when found give directions of where to go next and what to look for. Might have a surprise treat waiting at the end - state conservationist or local hobbyist with plant display, or have corn to pop, or sack lunches or weiners to roast or watermelon, etc.

Sample:

Station one - Pinch a leaf and let all smell it. What does it smell like? (mint) Go to the wood pile.

Station two - How old is the largest log?
Go to the closest water (stream).

Station three - Count the number of different looking (shapes, colors, sizes, textures) plants in the roped off area. Go nine paces toward school.

Station four - Sketch the shape of the tree with leaves shaped like mittens. How are the leaves attached to the branches? Go to the flag pole.

Station five - Observe the area within the string from 6 inches away. List everything this plant has in its environment. Go to station three and crawl to the dead tree.

Station six - How many different colors and shapes of plants did you see on your crawl? What is happening to the dead tree? Go to the back steps of the school.

Station seven - Write a song, paragraph, poem - about just one station or just one thing you observed at 1 station.

When the whistle is heard, all gather around the flag pole.

materials - strings, pencils, paper, clip boards.

4) Tree Care - Have individual students or small groups plant a tree in a mutually designated spot. Good time to have state forester or local hobbyist assist with planting. Keep watered and weeded. Observe new growth, flowers, seeds, sprouts. Where are the roots? What does the bark look like? Feel like? (old and new). Where do the leaves sprout from? What lives around the tree (plants and animals)? Is there air, water? What about man? Is he helping or hindering its growth? Keep a log of the tree's progress.

5. Activities (con't.)

materials - trees known to be healthy and ready to transplant. Contact state forester and/or local nurseryman for guidance and assistance, shovels, water.

5) Tree or Plant Trailing - Have small groups of students with teacher aide follow directions such as:

a) Go to the tree with a robins nest in it.
b) Find some 3 leaved poison ivy (from a distance!).
c) Look for young trees with deeply notched or lobed leaves.
d) Hop up to a tree with bumpy bark.
e) Now go to a group of trees green all year.
f) Find the class tree book and have fun looking up what was observed.

materials - paper or cards with directions, tree book for locality.

6) Treasure Walk - Each small group of students with a teacher aide walks through a small outdoor area. Each student looks for his own special plant treasure - something he thinks looks pretty, smells pretty or reminds him of something nice. Do not touch or pick. Get a picture in your mind. Later share with others by telling, sketching, drawing, singing, pantomine, etc.

materials - memory, pencil, crayons, chalk, etc.

7) Rainbow Hunt - Aide has small group of students observe for as many different colors andshades of plants on a walk. Later discuss and compare.

materials - out-of-doors.

8) State Plant - flower, tree - Have students find out what the state plant, flower and/or tree is. Write the state conservation commission or publicity bureau. Do you have any in your area? Where does it grow? What color(s) is it? What is its size? Where does it live? What does it do (ecology)? Why is there a state plant, flower, and/or tree? How was it chosen? What can we as students do to protect it? To promote it?

5. Activities (con't.)

materials - pamphlets, pictures from state to show and explain plant, flower, tree. Have state conservationist come and show and explain.

9) Quests - Each small group of students and teacher aide has a list of discoveries to look for on the walk, hike or trip. Names of things aren't as important as observing - things that look, feel, smell, hear - differently and similarly:
   2 kinds of bark (rough, smooth)
   grass or weeds in cracks
   2 kinds of plant stems (round, triangular, square)
   flower of a particular color
   different shaped seeds
   2 kinds of mosses

materials - card or paper with discoveries, pencil to check off.

10) Hitchickers - Individual students or in small group with teacher aide look for a variety of different kinds of hitchhikers - seeds and burrs carried by man, wind, animals, water, birds. (Collect only samples of plentiful).

materials - out-of-doors, plastic bags for collecting.

11) Grass (or other plant) Collections - Have each group of students with a teacher aide collect a variety of locally found grasses. (Be sure to get permission and only take samples for group.) Mount on paper and cover with plastic. Or, put between two sheets of waxed paper and press with warm iron. Display native grasses, invite other groups to observe; research names, etc.

materials - dark construction paper or posterboard, clear plastic film, or waxed paper, iron, plastic collecting bags.

5. Activities (con't.)

12) Flower (or Plant) Puzzle - Have group of students and teacher aide collect several distinctive, yet common flowers or other plants from the flower or vegetable garden or vacant lot (with permission). Cut apart each plant so as to separate the flower, leaves, buds, stems, roots. Mix the sections. Have the students (try to) combine the right parts for each plant.

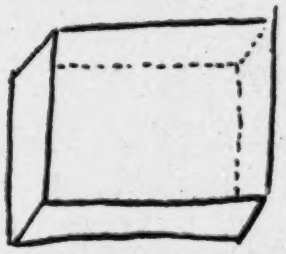
materials - plants such as rose, goldenrod, daisy, dandelion, sunflower, carrot, beet, corn, radish, etc; scissors.

Or, have one plant per student, cut into parts, mix and reassemble.

13) Spatter Painting - Collect interesting, pretty, different shaped leaves. Place one leaf on paper. Place screen box over it. Dip old tooth brush in water paints and scrap across screen. Gently lift screen and leaf; let dry. Use as stationery and/or display.

materials - variety of local leaves, water color paints or inks, old tooth brush or old small paint brush, old window screen, cigar box or similar sturdy cardboard box, white or light colored paper.

Sample:



cut out bottom and cut off lid

Bend and/or staple screen to top

14) Traveling Seeds - Have each group of students and teacher aide collect and/or observe as many different kinds of seeds as they can. Arrange seeds by following categories:

Parachute Seeds - dandelions, milkweeds, catalpa, thistle,
Seeds that Hitchike - burrs, beggar, ticks, bedstraw, foxtails, cockleburs, Spanish needles
Helicopter Seeds - boxelder, ash, maple, basswood
Shake Out - mullein, pepper grass, primrose.
Pop Out - jewelweed, violets
Animal kidnapped - acorns, pinecones, nuts, grape seeds, cherry pits

materials - area with variety of plants, or big variety to group, plastic bags for sample collecting (get permission, only surplus).

15) Individual Terraria - (please refer to appendix for general directions). These can be made for several different environments - moist - stream, puddle, pond, bog; field grasses;

5. Activities (con't.)

forest floor; desert; mountains, alpine. Use soils, rocks, small plants and animals suitable for particular environment. Small containers might be used: pint or quart glass jars with wide mouths, short wide drinking glasses, plastic pint or quart freezer containers (preferably clear to enable observing and light); aluminum foil pie tins, chicken or turkey pie tins; etc.

Cover with piece of glass (smoothed edges) or saran wrap (or similar plastic). Each student can gather his container as well as natural materials; place in container as desired, add moisture, cover and observe. Periodic slight additions of moisture may be required to keep things alive - pending on loss of air.

16) Lima Bean Seeds (comparing growth) - (refer to Guide II. C., Water). Continue with soil project. Or, have each student or group of students plant a lima bean seed in:
   a) Good topsoil
   b) Subsoil
   c) Cotton

Place in area with sunlight and moisten periodically. Might also place a set in darkness (cupboard or cover with paper bag). Or limit the amount of moisture each container receives. Observe, discuss and compare the different seed growths.

materials - aluminum cups, pie tins, paper or styrofoam cups or jars, etc., watering can, paper bag or cupboard.

17) Natural foods - Have group of students with aide gather, clean and eat different natural foods. Some may need to be prepared before consuming-peel, add sugar and/or cream, boil, strain. You might wish to make waffles (or pop frozen waffles in toaster) and serve with berry syrup made by students. Invite other classes, friends, etc. (Be sure to get permission to gather on private and public properties).

materials - local foods -
roots - carrots;
stem - celery;
leaf - lettuce, cabbage; flower - cauliflower;
seeds - beans, corn; eating utensils, preparing utensils, clean-up utensils.

5. Activities (con't.)

18) Observation Lotto - Write or picture things to look for (either out-of-doors or in books and magazines and terraria) on card or paper. Have individual students or small groups and aide fill in their card as in bingo or lotto. Continue until all students fill in all spaces on their cards.

materials - card or paper, pencil to mark or something from nature to mark appropriate square, (stick, pebble, grass, etc.)

Sample:

Milkweed Pod	Round Leaf	Thorn
Rough Bark	Mulberry	Long thin leaf.
Nut	Cat Tail	Dandelion flower or Seed.

19) Cut some branches in winter, put in water with sugar added. Watch action of buds. Change water every 3 - 5 days.

materials - glass, water, branches, sugar, scissors or knife.

20) On different days; stand in the wind in the open, and in the shelter of plants; in the rain in the open, and in the shelter of plants; in the sun and in the shelter of plants. Where is it warmer? Drier? More calm? How do plants affect the temperature?

5. Activities (con't.)

c. Materials and Definitions

Vocabulary - Use activity and discussion words. Plants usually have: roots, stems, leaves, flowers and seeds. Students should be able to distinguish between major plant parts.

Materials - Teacher should have, either in the classroom or out-of-doors, readily available samples of a variety of plants (moss, various leaves, ferns, large and small plants).

Other materials vary according to which activities the teacher chooses. A materials list follows each activity explanation.

d. Time and Place

Any time - Try same activities at different times of a particular day, or different temperatures or air conditions, or different seasons.

Place - Some activities may be done in a natural setting and some in the classroom. It would be advisable if the teacher would use both settings.

6. Related Curriculum Activities

As mentioned in the Introduction, Outdoor Education is not just another curriculum, it is largely a method in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

a. Recreation - Collect various seeds as a hobby, or (leaves or flowers). Plant vegetables and/or flower gardens around school and/or home. Dye handkerchiefs or T-shirts from plant dyes. Prepare home meals, or parts thereof, from natural plants - dock, water-cress, apples. Try whittling a design and/or whistle.

1) Kick Stick - Have each student decorate a stick by painting and/or wood burning and/or whittling. On signal students kick their stick from starting line to finish line. Or, kick stick in a circle. Or, in and around obstacles, such as rocks, puddles, shrubs, and trees.

materials - strong straight sticks 1" thick by 4½" - 5" long (can use curved sticks as get more advanced), paints and brushes, knife, wood burning tool.

2) Javelin Throw - Have each student decorate their javelin by peeling the bark in designs, wood burning, whittling and/or painting. Who can be the most creative? Colorful? Variety of decorations? To throw - rope off target area, all throw from same line, all wait until signal to gather javelins.

6. Related Curriculum Activities (con't.)

Those not throwing should be behind the throwers and their line. (Not near the target area). Javelin is held in the middle and thrown from shoulder height.

materials - willow, or similar, branch about 5 feet long and about 1" in diameter at 1 end tapering smaller to the other end, paints and brushes, wood burning tool, knife.

3) Friendship Sticks - Each student decorates his stick by painting, carving, or woodburning. Purpose is to give to a friend.

materials - 12" stick (broom handle, tree branch, dowels - ¾"-1"), brushes and paints, wood burning tool, knife.

4) Stick Around - Each student holds several small sticks or twigs in one palm. Toss them all into the air catching as many as he can on the back of his hand (or in the palm), toss those caught in the air again and catch as many as possible in the palm. Odd numbers caught get 1 point. Even numbers or none caught may lose his turn or score zero. Final score may be 7 (11 or 15).

5) Dying With Natural Materials - General procedures: soak material (berries, roots, stems, barks, leaves, flowers, skins, hulls,) in kettle overnight. Boil one hour or more. Strain through cheese cloth to separate plant materials. When ready to dye put enough water in kettle to cover the cloth. Then add dye and bring to boil. Now put cloth in, leaving until desired shade is acquired. Then take out cloth with tongs, ring out, dry.

materials - large enamel kettle, cotton, linen, rayon or wool material, large strong tongs or stick to stir or pick cloth out of kettle, some place to dry cloth, local plants (materials) for dyes.

Gathering Suggestions:
Barks - spring or early summer
Berries - when ripe
Flowers - height of bloom
Leaves - late spring, at full growth
Roots - fall
Seeds - when ripe
Stems - spring or early summer

Suggestions - In order to make the dye fast: 1 oz. alum per gallon water.

Wool - add ¼ oz. cream of tarter
Cotton, linen, rayon - add ¼ oz. washing soda
Boil cloth at least 1 hour, rinse well and dry thoroughly.

6. Related Curriculum Activities (con't.)

Berries and Stems - place in little water and boil 2 hours, strain and add 1 part wood alcohol to 3 parts dye (this keeps dye mixture from spoiling too quickly).

Barks and Roots - Place in a little water and boil 4-5 hours, strain and add 1 tablespoon salt to each pint of dye.

Goldenrod - The plant and flowers should be chopped into small pieces. Then put into kettle with water and bring to boil. Let simmer several hours before allowing to cool. Wait 24 hours, reheat, strain then add cloth and simmer till color desired is obtained.

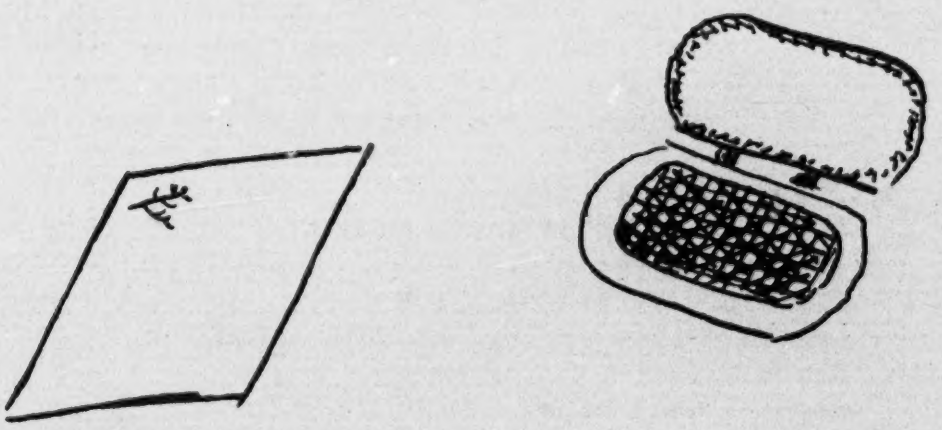
Onion Skins - Place in a little water and boil 2-3 hours. Strain, then add cloth and boil 1 hour.

6) Fingerpainting - Natural dyes (refer to dying directions, #5). Have students wear old large shirts (protect clothes from dyes). Use natural dyes as you would use fingerpaints.

7) Note Paper - Have students collect delicate leaves, grass, seed tops - press flat between paper towels between 2 books. Place one piece in ink pad and press down with piece of wax paper or paper towel. Pick up grass with tweezers and place where desired on paper. Press with clean wax paper or towel & gently pick off with tweezers. Let dry (can roll with pin or bottle but tends to make print too coarse.

materials - delicate grass seed tops, leaves, variety of colored ink pads, wax paper, paper towels, tweezers, paper.

Sample:



b. Physical Education - Have students pretend they are seeds, growing into plants, flowering, dieing and going to soil.

6. Related Curriculum Activities (con't.)

c. Music - Create! Make up songs and/or music about trees, shrubs, plants, flowers, etc.; their growth, beauty, use, etc. Sing songs about plants.

d. Art - Be creative!

1) Mobiles - Using parts of dried plants, flowers, leaves, fruits, or cutouts of different plants - tree, shrubs, grass, flower.

2) Sketch local plants - Make a mural showing seed, plant, flower, seed, decay.

3) Mushroom Spore Designs - Group of students and aide collect mature mushrooms (perhaps need a resource person). In the classroom cut the stem up close to the gills. Gently put the mushroom top on paper with gill side down. Then cover with a can or box to prevent the spores from being blown away. About 20-30 minutes later carefully lift the can. To preserve, spray (from distance so as not to disturb design) with clear plastic.

materials - white or black construction or other paper, can or box, spray plastic or similar preservative.

4) Weed and/or Seed Scenes (murals, pictures) - (another item for display) - What plants, parts of plants and in different seasons can be used in creating natural and/or imaginative scenes? Have students, with aide, collect various natural items - use imagination, be creative (get permission first to collect). Invite others to view and enjoy display. Observe and discuss while collecting. Use a box, wood slab, paper, shell, rock, bark, fungi or even a spot in a school patio - fenced off with rocks or twigs.

Possible materials and uses - weeds - forests, trees
nuts and shells - boats, food
cones - animals, birds
seeds - animals, birds
seed pods - boats
flowers - blossoms, color
roots - old stumps
pebbles - rocks
sand - hills, beach, color
moss, lichen - bushes, hills
charred wood - sketch, fire, dark
bark - hills, back drop, buildings
berries - bushes, color
twigs - fences, trees
corn (silk, pods) - color, grass
milkweed silk - clouds, snow

materials - glue, water color paints, natural materials.

6. Related Curriculum Activities (con't.)

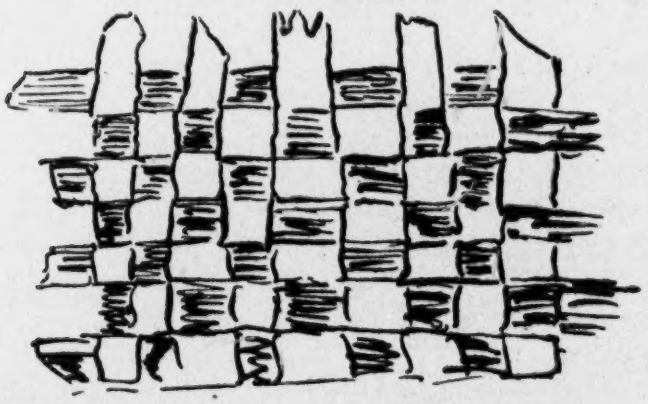
5) Nature animals, birds, people - While on any out-of-door walk or other activity or take walk just to collect various natural objects - while still out-of-doors or in classroom 'construct' imaginary animals, birds, people. Display, invite others to view and enjoy. Observe and discuss various objects while collecting as well as after constructed - fun to see what others used. Use natural objects as in 4).

materials - glue, water color paints and brushes, natural materials.

6) Cattail crafts

Braiding - 2 strips of split leaves per strand - bracelet, add pendant such as cone, bark or name tag for necklace. Use to hang up utensils.

Net holder - knot 8-10 split strands together at one end. Place container on knot then move strands to form circle. Tie 2 strands together over top and repeat.



7. Evaluations

(check appendix for sample instraments)

a. Check list
b. Fill-In, Drawing, Sketching, Writing, Etc.
c. Objective
d. Subjective
e. Teacher Comments on Behavior
f. Verbal Test of Students Knowledge

8. Suggested Further Activities

a. Repeat same activities covered, only in different areas (park, home, playground, etc.). Compare, discuss.

b. Carry out activities not already carried out.

8. Suggested Further Activities (con't.)

c. Add similar activities and/or change activities for repeating concepts.

d. Continue with Mini-Exploration Guides.

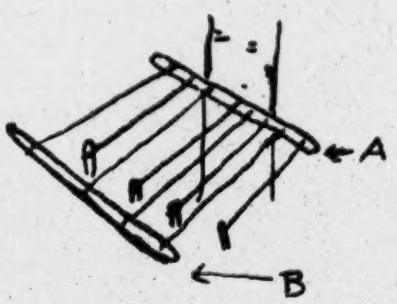
e. Encourage the FUN aspects of exploring and observing.

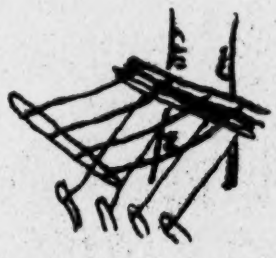
f. Encourage students to do similar activities on their own, with friends and/or family.

g. Keep records of specific area - changes day to day; or week to week, or different seasons.

h. Making & Using a Navaho Weaving Loom - Table mats, rugs and/or Sit-Upons -

Materials - 2 sticks, dowels or broom handles 3 feet long by about 1" diameter, Stakes (# depends on size of mat desired and closeness of weaving) dowels or broom handles - 16" long by about 1" diamter. Any tall dried grasses - sedge, slough, swamp or other tall grasses. Cattails, round stem rushes, sedges (triangular stems). String - 4' and 5' lengths. 2 saplings - about 1' in diameter, 2 feet, or less apart or 2 strong stakes (dowels, sticks, broom handles) about 24"-30" long and 1-1½" in diameter





Loom - Lash one 3 foot stick between 2 saplings (or the two 24" stakes) about 18" to 24" up from the ground. Drive the number of desired 16" long stakes into the ground about 4". Space about 3 inches apart and desired distance out from the saplings.

Tie one end of each string (according to number of stakes - the mat size) to long stick 'A' - alternating 4' and 5' lengths. Tie the other end of the shorter (4') lengths to a stake.

Tie the ends of the longer lengths (5') of string to the other 3' stick ('B'). After the strings are tied the stick should pull evenly to the ground about 6" beyond the small stakes.

8. Suggested Further Activities (con't.)

To Weave - While student (1) holds up stick 'B' student (2) puts a bunch of grass (or whatever is used) on the strings up close to stick'A'.

Student (1) then lowers stick 'B' to the ground while student (2) puts another bunch of grass on the strings tightly against first. Student (1) raises stick 'B' and they continue this process until mat is desired size.

Undo the knots or cut the strings on the sticks and stakes; tie 2 ends firmly together.

Teaching points or suggestions - Have students work in pairs or small groups with teacher aide. Have students collect the sticks and stakes and the grasses and allow to dry a few days. Vary the thickness of the grass bunches to make a thicker mat. To make larger sized mats use more 16" stakes - keeping about 3" apart, move farther from the two saplings and use longer lengths of string.

i. Pine Needle Circles - On one of your collecting trips or separate walk gather a bundle of pine needles - 5, 3, 2. Cut off the ends and observe; observe under hand lens. Each needle will be a section of a circle or pie. Put all 5 (3, 2) needles together to form circle.

materials - pine needles, knife or scissors, hand lens.

j. Gourds - Plant seeds, care for plants and gather gourds several months later. Numerouse items can be made or the gourds may be decorated or used as is, (birdhouses, rhythm band instruments, ladles, cups, salt and pepper shakers, table center pieces, etc.).

9. Resources

The following listing will be updated as additional materials are received and/or reviewed by the Handicapped Children's Nature Study Center. In addition please consult the appendix and the I.M.C. book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available from the H.C.N.S.C.

a. BOOKS

Discovering Plants
Blough, Glenn O.
McGraw-Hill, N.Y., 1966

First Book of Wildflowers, The
Cavanna, Betty

9. Resources (con't.)

Forest, The
Fart, Peter

Green is for Growing
Lubell, Winifred &
Lubell, Cecil
Rand McNally, 1964

How A Seed Grows
Jordan & Hagner

How Plants Grow
Newrath, Marie

Look At a Flower
Dowden, Anne Ophelia T.
Thomas Y. Dowden Co.,
N.Y., 1963, 120 pp.

Plants With Seeds
Wood, Dorothy

Play With Seeds
Selsam, Millicent E.
William Morrow & Co.
N.Y., 1957, 93 pp.

Seeds By Wind & Water
Jordan & Hogner

Tree Is a Plant, A
Bulla, Clyde R.

Tree Is Nice, A
Udry & Smoot

Wonderland of Plants
Shannon, Terry
Whitman, Chicago, 1960

b. CHARTS, POSTERS, FLASHCARDS

* American Forest Institute 1835 K Street, N.W. Washington, D. C. 20006	"Growth of A Tree"
* National Audubon Society 1130 Fifth Avenue New York, New York 10028	"Common N.A. Evergreens" - 35¢ "Common Seed Travelers" "Leaves of Common Trees" - 35¢ "Twigs of Common Trees" - 35¢
* Society for Visual Education 1345 Diversey Parkway Chicago, Illinois 60614	"Spring Wildflowers" - (and other sets)
* U.S. Dept. of Agr. Forest Service Wasington, D.C. Or local region	"Forests & Trees of the U.S." "How A Tree Grows" - 20¢ "What We Get From Forest Land" - 35¢ "What We Get From Trees"

c. FILMS, FILM-STRIPS, SLIDES

Children In Spring, color, 11 minutes
Encyclopedia Brittanica Films, Inc.
1150 Wilmette Ave.
Willmette, Illinois 60091

Clothes We Wear, The, color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

9. Resources (con't.)

Forest Conservation, color, 11 minutes
Encyclopedia Britanica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

How Forests Help Us, color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Learning About Flowers, color, 11 minutes
Encyclopedia Brittanica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

Learning About Leaves, color, 11 minutes
Encyclopedia Brittanica Films, Inc.
1150 Wilmette Ave.
Willmette, Illinois 60091

Learning About Seeds, color, 11 minutes
Encyclopedia Britannica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

Seeds Grow Into Plants, color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Tree, The, color, 11 minutes
Churchill Films
6671 Sunset Blvd.
Los Angeles, California 90025

Tree Grows For Christmas, A, color, 11 minutes (and other titles)
U.S. Forest Service, Dept. of Agriculture, Washington, D.C. 20250
(check your local region for catalog of titles and descriptions.)

Tree Is a Living Thing, A, color, 11 minutes
Encyclopedia Brittanica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

We Explore the Field & Meadow, color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

9. Resources (con't.)

Where Does Our Food Come From?, color, 11 minutes

Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Wildflowers of the Field & Meadow, color, b/w, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

d. MAGAZINES

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The, "How Plants Get Around"
Stanley J. Smith, p. 23-26, October-November, 1967
State of New York Conservation Department
Albany, New York 12201

National Geographic
National Geographic Society
Washington, D.C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

e. PAMPHLETS, BOOKLETS, LEAFLETS

* "Why Leaves Change Color" (and other titles)
United States Department of Agriculture
Forest Service
Washington, D. C.

9. Resources (con't.)

* National Audubon Society plants (and other titles)
  1130 Fifth Avenue
  New York, New York 10028

* "Four Seasons of Fun for Youngsters"
  Zucker, Isabel
  National Garden Bureau
  708 West Long Lake Road
  Bloomingfield Hills, Michigan 48013

f. MISCELANEOUS

* National Audubon Society - teacher packets - plants (and other topics)
  1130 Fifth Avenue
  New York, New York 10028

* The Garden Club of America
  598 Madison Avenue
  New York, New York 10022
  "The World Around You, Our Natural Resources Packet"

Please check appendix for further resources

II. GUIDES BY COMPONENTS OF OUR ENVIRONMENT

E. ANIMALS

1. Aim

   To begin to explore one component of our total environment through our senses.

2. Purpose

   Presumably, by now the students have begun to become sensitive to their environment by having practiced observing with all their senses. In order for them to understand their environment in its totality, they should begin to use their powers of observation on each of the individual components of the environment.

   Students need to use their senses in exploring environments not only in the Handicapped Children's Nature Study Center and in their classrooms, but almost more importantly, they need to continue their sense observations and mini-explorations with their families and friends as they grow and experience <u>outside</u> their school activities.

3. Educational Objectives

   a. Each student should see several animals.

   b. Each student should see animal homes of several types.

   c. Each student should look for animal tracks of several types.

   d. Each student should look for animals at different heights (underground, ground, tree, air).

   e. Each student should look for things animals eat.

   f. Each student should look for animals using plants, soil and water.

4. Concepts

a. There are many kinds of animals.

b. There are many shapes and sizes.

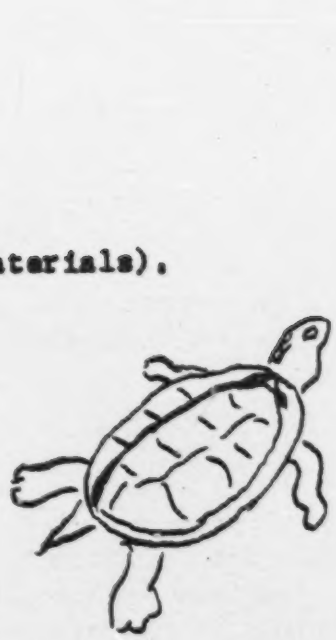
c. Animals live in many different places.

d. Animals eat different things (plant and animal materials).

e. Animals are necessary to man.

f. Animals need plants, soil and water to live.

g. Man needs animals for his life.



5. Activities

a. Suggested Lead-Up Activities

1) Carry out Guides I and II A, B, C, & D of Unit II.

2) Discuss the particular activities your group is going to carry out - methods, materials, and behavior in the out-of-doors.

3) Discuss the word animal - a living being which can move from place to place.

4) Discuss how animals move (legs, fins, wings, muscles, etc.).

5) Discuss animal homes (ground, tree, grass, pond, stream, etc.).

6) Look through books, pamphlets, magazines, etc. for the different types of animals.

7) View films, film-strips and/or slides of the various animals.

b. Activity Procedures

The following activities are all related to understanding animals. It is suggested that the teacher choose the activities which are most practical and feasible for her particular students. Ideal group size is 6-8. Groups larger than that should have an aide so that no leader is responsible for more than 8 and preferably no more than 6 students. This enables all in one group to observe an item together.

1) Animal Hunt - Using the sense of sight and looking from the ground to the sky, walk around the school yard or neighborhood and see how many examples you can find of:

Animal tracks (prints, teeth marks, droppings, hair, etc.)
Animal homes (nests, ant hills, holes in trees, brush piles, crawdad burrows, pond, etc.)
Animal food (other animals, leaves, nuts, grasses, bark, etc.)

2) Tracking - Put out feed in damp clay or other open soil area, leave overnight. Observe tracks next day. Who made them? Which track ate which food? Why do they eat at night? Try near a small stream or pond. Dispose of foods not eaten.

materials - foods, such as: carrots, lettuce, peanuts, wild bird seed, bread crumbs, bits of hamburger.

3) Plaster Casts - (refer to appendix for directions). Paint casts and use for paper weights.

4) State Animal, State Bird - Have students find out what the state animal and/or bird is. Write the state conservation commission or publicity bureau. Do you have any in your area? What does it eat? What color(s) is it? What is its size? Where does it live? What does it do (ecology)? Why is there a state bird and/or animal? How was it chosen? What can we as students do to protect it? To promote it?

materials - pamphlets, pictures from state to show and explain animal and/or bird. Have state conservationist come and show and explain.

5) Hole Spying - Have students in small groups with teacher aide walk through natural area - spying for signs of different animal life - holes - in the soil from ant size to woodchuck, in rocks, in sand; in leaves, in bark, and in tree trunks.

6) Rainbow Hunt - Each student or group of students and aide observe all the different colors and sizes as possible in animals and/or birds. Keep a list. Compare and discuss.

7) Bird Walk - Small group of students with teacher aide - walk through natural outdoor areas - listen for bird songs (or is there too much Man noise?!), look for old and/or new nests, look for birds of different sizes (sparrow, robin, crow), look for birds flying high, low, straight and up and down, look for birds feeding (themselves and/or young).

materials - natural area out-of-doors known to have variety of birds.

8) Spider Webs (1) - After gently tickling away the spider, spray the web with paint, holding the can at a distance so as not to spoil the web. Ease the paper under the wet painted web and gently break the main web lines.

materials - colored or black construction paper, spray paint of desired color(s), spider web.

(2)-After shooing the spider away sprinkle some flour on the web which still has dew on it. Place the paper under the web and gently break the main web lines, allowing web to be on the paper. Spray with clear plastic to preserve.

5. Activities (con't.)

materials - spider web with dew on it, flour, black construction paper, clear plastic spray or similar fixative.

9) Netting - (refer to appendix for directions) - butterflies, beetles, frogs, insects - for use in water and others for use on land. Have fun netting these small animals to put in small cages for short term observation.

10) Short Term Cages - (refer to appendix for directions) - (Keep for only a few days - observing, feeding, caring, finding food, shelter) - Feed:

Ants - solution of sugar and water (Ant colony - see Appendix)
Spiders - honey
Moths, butterflies, caterpillars - weeds found on
Salamanders, snakes, frogs, turtles - soil, rocks, moss, small plants, bits of raw meat, scrambled eggs, flies and other insects.

11) Feathers - Collect all shapes, sizes and colors of feathers - observe colors, shades, structure, sizes, shapes. Use in collage type pictures or make birds just of feathers or make abstract art pictures and/or objects.

materials - variety of feathers - colors, sizes, shapes, glue, paper or posterboard.

12) Bird Houses, Feeders, Baths - (refer to appendix for instructions) - Gather materials, cut (saw) smooth, finish with paint and/or spare varnish, assemble (or assemble and then finish), put in suitable place, feed, water, observe, compare, enjoy.

materials - refer to appendix.

13) Bird Nest Dissecting - Have students put like materials in separate piles on paper or something to help see material and keep together. What materials were used? Which is the most prominent in number? Size? What is smallest in number? Size? Where did materials come from? Can similar living plants be located? Look up to see what birds might have used similar nests.

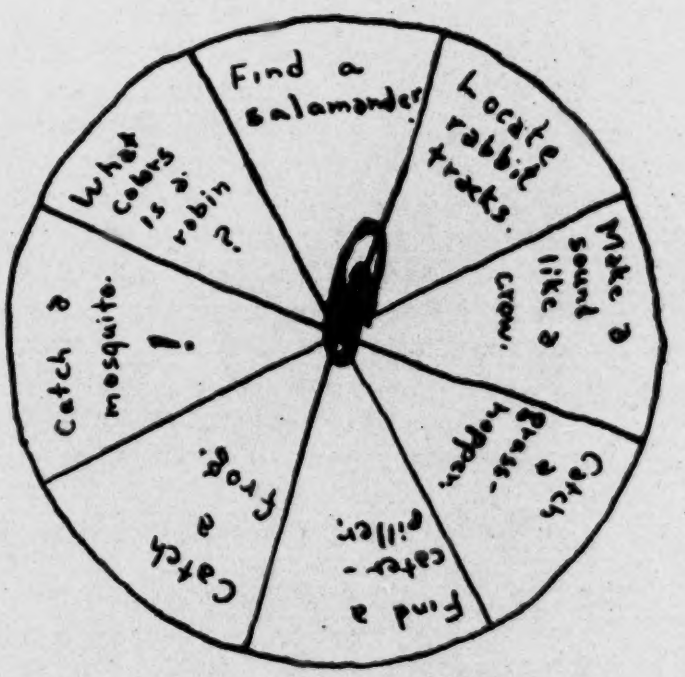
materials - <u>old</u> bird nests not in use - best time to collect is fall, winter, and <u>early</u> spring - of various sizes and shapes - from ground, grasses, shrubs, trees, porches. Paper or something to sort materials on. Books on birds and their nests.

5. Activities (con't.)

14) Butterfly Hunt - Have students draw and/or color large and small butterflies on their paper. Divide the class into two groups. Have each group go to opposite areas (woods - field, front of school - back of school, etc.) and attach them anywhere a butterfly might land (high, low, under, etc.). Then groups exchange areas and collect all the butterflies they can find. Discuss where they were found. Do some research on butterflies. Put the butterflies on a bulletin board, or make a mobile or put them on a mural in a similar area as found. Or, when each group brings back the butterflies they located have them describe where it was found - up, down, under; plant, soil, animal; surroundings; weather; etc.

15) You're It - Draw a large circle and divide it into 8 or more sections. In each section write, sketch or paste pictures of animals to locate. Gear the instruction - questions to your curriculum, students and available resources. (Maybe your students can give some suggestions for questions.)

Push a straight pin into the middle of the circle and put a paper clip over it. Have each student take a turn spinning the paper clip. He follows the instructions in the section in which the paper clip points.



If living animals aren't available or you don't care to have them brought to school - use book and magazine pictures, or have students note location, description or make a sketch, or have samples on a table and have students point to or pick up correct item.

materials - large paper or posterboard, compass (or draw by hand), pencil, natural animals according to questions and instructions or books and magazines, straight pin, paper clip.

5. Activities (con't.)

16) Treasure and/or Scavenger Hunts - Make up lists of different animals to be brought back or just located and observed, for each small group with teacher aide. Or, have clues posted in each area and when found give directions of where to go next and what to look for. Might have a surprise treat waiting at the end - state conservationist or local hobbyist with animal display, or corn to pop, or sack lunches or weiners to roast or watermelon. Bring only such things as insects, frogs, toads or turtles. Replace all but insects where they were found. Example:

Station 1 - Find some small white eggs - - Why are they where you found them? Go to the basketball backboard.

Station 2 - What color is the sky? What lives around the hoop? Go to the soil at the edge of the basketball court.

Station 3 - How many animals can you see inside the string? Go to the puddle near the swings.

Station 4 - About how large are the animals in the puddle? What color is the soil around the puddle? Go to the tallest tree in front of the school.

Station 5 - Locate the nest in the tree. Describe its shape and/or materials. Can you spot the bird? Go to the picnic tables.

Station 6 - Make a poem (or paragraph or sentence or sketches) of what you each observe now while lying on the ground and looking up toward the sky (or under a a tree or straight ahead, etc.). When you hear the whistle, gather around the bar-b-que.

17) Bring-Them-Back-Alive Jaunt - A small group of students with a teacher and/or aide takes a walk outdoors to find, observe and collect small animals such as spiders, salamanders, caterpillars, mosquitoes, ants, flies, worms, butterflies, etc. House in simple cages, feed, observe, research a little, let go in a few days. Put salamanders, frogs and toads where you found them. Do not try to capture bees or wasps.

materials - jars, snake nets, simple cages (refer to appendix).

18) Materials for Bird Nests - Put pieces of twigs, string, yarn, strips of cloth, cotton balls and a little suet in mesh bags. Hang in trees in early spring. Observe different birds and which materials they take. Where do they go? Where is their nest?

materials - mesh bags (onion, oranges), string, twigs, cotton balls, yarn, strips of cloth, suet.

c. Materials and Definitions

Vocabulary - Use activity and discussion words (bird, mammal, fish, amphibian, insect). While precise definitions are not needed, students should be able to distinguish among the animal forms. Let students see animals or pictures of animals and make own definitions or descriptions.

Materials - Teacher should have, either in the classroom or out-of-doors, readily available various species of animal wildlife (rabbit, mouse, bird, turtle, invertebrates, etc.).

Other materials vary according to which activities the teacher chooses. A materials list follows each activity explanation.

d. Time and Place

Any time - Try same activities at different times of a particular day, or different temperature or air conditions, or different seasons.

Place - Some activities may be done in a natural setting and some in the classroom. It would be advisable if the teacher would use both settings.

Length - It is suggested that the teacher carry out these activities over a period of several days or weeks and that the maximum length of any one day's activities be no longer than one hour.

6. Related Curriculum Activities

As mentioned in the Introduction, Outdoor Education is not just another curriculum, it is largely a method in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

a. Recreation - Make nets and collect land and/or water insects for short term; observe different types of tracks - snow, mud, droppings, rubbings, bones, scratchings. Have fun making up quizes or contests with animal silhouettes made in art.

1) Writing With a Quill Pen - From goose or turkey feathers cut out the end of a quill on a slant and make a short slit at the tip to hold the ink. For Gull or water bird quills, cut the end of the quill on a slant but don't put a slit in it. (These are soft and will not hold their shape if split). For pheasant quills use only those with no holes in the end. These will write without cutting or slitting. Try making straight line designs and/or printing names to start.

materials - goose, turkey, gull or waterbird, or pheasant quills, knife, paper, ink (black or variety of colors) or use ink made from berries.

6. Related Curriculum Activities (con't.)

2) Fishing - Have students gather worms and/or suitable bait for local fish. Bait hooks, drop lines, catch fish and remove from hooks. Either throw back or clean, cook and eat. Observe fish, as well as other animal life - frogs, snakes, grasshoppers, water bugs, etc. in area.

materials - 6' stick, 25 feet string or fishline, small hooks, worms, bread, cheese, or other bait.

3) Observation Lotto - Write or picture things to look for (either out-of-doors or in books and magazines and terraria) on card or paper. Have individual students or small groups and aide fill in their card as in bingo or lotto. Continue until all students fill in all spaces on their cards.

materials - card or paper, pencil to mark or something from nature to mark appropriate square, (stick, pebble, grass, etc.).

Sample -

Robin	Frog	Bee
Butterfly	Crow	Grasshopper
Salamander	Ant	Masquitoe

6. Related Curriculum Activities (con't.)

4) Treasure Walk - Each small group of students with a teacher aide walks through a small outdoor area. Each student looks for his own special animal treasure - something he thinks looks pretty, smells pleasant or reminds him of something nice. Do not touch or pick it up. Get a picture in your mind. Later share with others by telling, pantomine, etc.

5) Quests - Each small group of students and teacher aide has a list of discoveries to look for on the walk, hike or trip. Names of things are not as important as observing - things that look, feel, smell, hear - differently and similarly: 2 birds, animal with a hard shell, a flying invertebrate, animal that changes color in fall and spring, etc.

b. Physical Education - Have students pretend they are different animals - birds, invertebrates, reptiles, amphibians, mammals, etc. - walking, running, crawling, swimming, flying, sleeping, eating, etc. Play games about animals.

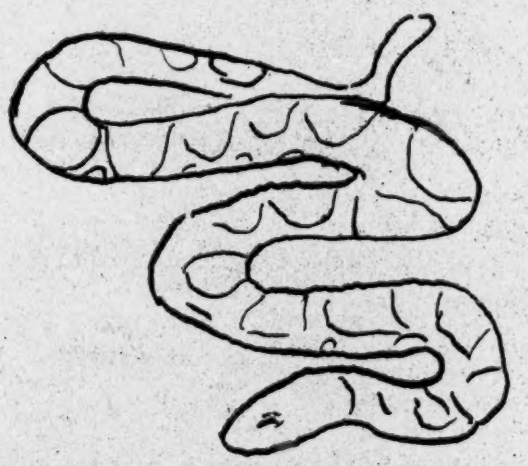
c. Music - Be creative! Listen to music, songs about animals, and/or listen to phonograph record of animal sounds. Sing songs about animals; make up songs about animals. Try imitating animal sounds.

d. Art - Create! Sketch patterns of insect movement, bird flights. Mobiles - using feathers, bones. Create animals from seeds, leaves, cones, or construction paper cut-out of shapes, etc. Make silhouettes of different animals - display, quiz, mobiles.

7. Evaluations

(Check appendix for sample instruments)

a. Check list
b. Fill-In, Drawing, Sketching, Writing
c. Objective
d. Subjective
e. Teacher Comments on Behavior
f. Verbal Tests of Students Knowledge



8. Suggested Further Activities

a. Make a list of all the ways animals might use:

1) Plants: food, shelter, protector, shade, build nest
2) Soil: hide in, hide food in, walk in, take dust bath in
3) Water: drink, wash, swim, cool
4) Air: breathe, cool, smell, odors

b. Repeat same activities covered, only in different areas (park, home, playground). Compare, discuss.

II. E.

8. Suggested Further Activities (con't.)

c. Carry out activities not already carried out.

d. Add similar activities and/or change activities for repeating concepts.

e. Continue with Mini-Exploration Guides.

f. Encourage students to do similar activities on their own, with friends and/or family.

g. Encourage the FUN aspects of exploring and observing.

h. Keep records of a specific area - changes day to day; week to week; or, during different seasons.

9. Resources

The following listing will be updated as additional materials are received and/or reviewed by the Handicapped Children's Nature Study Center. In addition please consult the appendix and the IMC book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available from the H.C.N.S.C.

a. BOOKS

About Garden Dwellers
Gibson, Gertrude H.
IMC # 13730 (P)

Animals At My Doorstep
Hoover, Helen
Parent's Magazine Press
New York, New York
1966

Animal Kingdon, The
Fichter, George S.
Golden Press
New York, New York
1968, 105 pp, $3.95

Dead Bird, The
Brown, Margaret Wise

II. E.

9. Resources (con't.)

Discovering Insects
Blough, G.
IMC #14533, (PI) 595.7

Everyday Animals
Allen, Gertrude E.
Houghton Mifflin
Boston, Mass.
1966

Field Guide to Animal Tracks, A
Olaus, Murie
Houghton Mifflin Co.
Boston, Mass
1954, 374 pp, $5.95

Field Guide to Tracks of North America Wildlife, A
Chase, Myron and Charles
N.A.S.C.O.
Fort Atkinson, Wisconsin
1969, 160 pp

First Book of Bugs
Williamson, M.
IMC #11506 (PI) 595.7

* Golden Nature Guides
Butterflies and Moths, Mitchell, Robert T. & Zim, Herbert S.
Mammals, Zim, Herbert S. & Hoffmeister, Donald F.
Reptiles & Amphibians, Zim, Herbert S. & Smith, Hobart M.
Golden Press, New York, New York
$1.25 each

Happy Animals
Weigle, Oscar
Grosset & Dunlap
New York, New York
1957

Pond Life
Reid, George K., Zim, Herbert S. & Fichter, George S.
A Golden Nature Guide
Golden Press, New York, New York
1967, $1.25 each

Song Birds in Your Garden
Tenes, John

II. E.

9. Resources (con't.)

* Tale of a Meadow, The
Kane, Henry B.
Alfred A. Knopf
New York, New York
1959, 115 pp

* Trip to the Pond, A
Hofmann, Melita
Doubleday & Company, Inc.
Garden City, New York
1966, 61 pp, $3.95

True Book of Birds We Know, The
Friskey, Margaret
IMC #11517

When An Animal Grows
Selsam, Millicent E.
Harper & Row
New York, New York
1966

c. CHARTS, POSTERS, FLASHCARDS

* Gull Lake Environmental Education Project Kellogg Bird Sanctuary Route 1, Box 339 Augusta, Michigan 49012	"The Life In A Pond" Environmental Education Series - WC-1-68
* National Audubon Society 1130 Fifth Avenue New York, New York 10028	HCNSC has complete sets of all Audubon materials - laminated for full use. Charts on Pond Life, Birds and Mammals.
* Nature Study Aid Specimens N.A.S.C.O. Fort Atkinson Wisconsin 53538	Front & rear raccoon paws, large toothed aspen - plastic - for studying & making prints.
* Society for Visual Education, Inc. 1345 Diversey Parkway Chicago, Illinois	Picture Story Study Print sets - Wild Animals, Familiar Birds, Common Birds, Common Insects (& other similar sets).

II. E.

9. Resources (con't.)

c. FILMS, FILM-STRIPS, SLIDES

Animals and Their Foods, also Animals and Their Homes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Attracting Birds In Winter, color, 6 minutes
International Films Bureau
332 S. Michigan Avenue
Chicago, Illinois 60604

Birds Of Our Storybooks, color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Birds of the Country Side, color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

How Birds Are Fitted To Their Work
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

Insects In A Garden, color, 11 minutes
Encyclopedia Brittanica Gilms, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

Looking At Birds, color, b/w, 10 minutes
Encyclopedia Brittanica Films, Inc.
1150 Wilmette Avenue
Wilmette, Illinois 60091

* Gull Lake Environmental Education Project
Kellogg Bird Sanctuary
Route 1, Box 339
Augusta, Michigan 49012

Slide and tape sets on Pond Life and Mammals.

II. E.

9. Resources (con't.)

d. MAGAZINES

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The
State of New York
Department of Environmental Conservation
Albany, New York 12201

National Geographic
National Geographic Society
Washington, D.C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

Nature & Science
Published for the American Museum of Natural History
By the Natural History Press
A Division of Doubleday & Co., Inc.
Central Park West at 79th Street
New York, New York 10024

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

e. PHONOGRAPH RECORDINGS

* American Bird Songs (album)
Cornell Laboratory of Ornithology
159 Sapsucker Woods Road
Ithaca, New York 14850

II. E.

9. Resources (con't.)

* Field Guide to Bird Songs, A (2 records)
Peterson, Allen and Kellogg
Houghton Mifflin Company
Boston, Mass.

* Animal Songs
Lenti, Anna
Columbia - CC - 23517
with illustrated song book

f. PAMPHLETS, BOOKLETS

* Fur-Bearers and Game Mammals of Iowa
Iowa State College
Ames, Iowa
February 1940, Bulletin P3
pp 116-147

* Iowa Mammals
Mustard, Eldie
Reprint from the Iowa Conservationist
Vol. 21, No. 10-12 and Vol. 22, No. 1-5
State Conservation Commission
Des Moines, Iowa

* Peek At Iowa Wildlife, A
State Conservation Commission
The State of Iowa
Des Moines, Iowa
1959, 26 pp, PB - 24777

II. GUIDES BY COMPONENTS OF OUR ENVIRONMENT

F. MAN

1. Aim

   To begin to explore one component of our total environment through our senses.

2. Purpose

   Presumably, by now the students have begun to become sensitive to their environment by having practiced observing with all their senses. In order for them to understand their environment in its totality, they should begin to use their powers of observation on each of the individual components of the environment.

   Students need to use their senses in exploring environments not only in the Handicapped Children's Nature Study Center and in their classrooms but, almost more importantly, they need to continue their sense observations and mini-explorations with their families and friends as they grow and experience <u>outside</u> their school activities.

3. Educational objectives

   a. Each student should observe human beings in many activities.

   b. Each student should observe people doing things with and to plants.

   c. Each student should observe people doing things with and to animals.

   d. Each student should observe people doing things with and to the soil.

   e. Each student should observe people doing things with and to water.

   f. Each student should observe people doing things with and to the air.

4. Concepts

   a. Man is the only thing in nature that can think and reason.

   b. Man can control plants, animals, soil and water wisely.

4. Concepts (con't.)

c. Man can destroy plants, animals, soil and water.

d. Man is not always careful with the other parts of the environment.

5. Activities

a. Suggested Lead-Up Activities

1) Carry out Guide I of Unit II.

2) Discuss the particular activities your group is going to carry out - methods, materials and behavior in the out-of-doors.

3) Discuss the word man, an animal with the ability to think, reason, choose, and decide. Man is used here to mean man, woman, boy or girl.

4) Look through books, pamphlets, magazines, etc. for types of men, and men doing things to the other resources.

5) View films, film-strips, and/or slides of different forms of man and of man saving or spoiling plants, animals, air, water or soil.

b. Activity Procedures

The following activities are all related to understanding the properties of man. It is suggested that the teacher choose the activities which are most practical and feasible for her particular students. Ideal group size is 6-8. Groups larger than that should have an aide so that no leader is responsible for more than 8 and preferably no more than 6 students. This enables all in one group to observe an item together.

1) Observation Lotto - Write or picture things to look for (either out-of-doors or in books and magazines and terrariums) on card or paper. Have individual students or small groups and aide fill in their card as in bingo or lotto. Continue until all students fill in all spaces on their cards. This activity may take a week, a month or longer to complete.

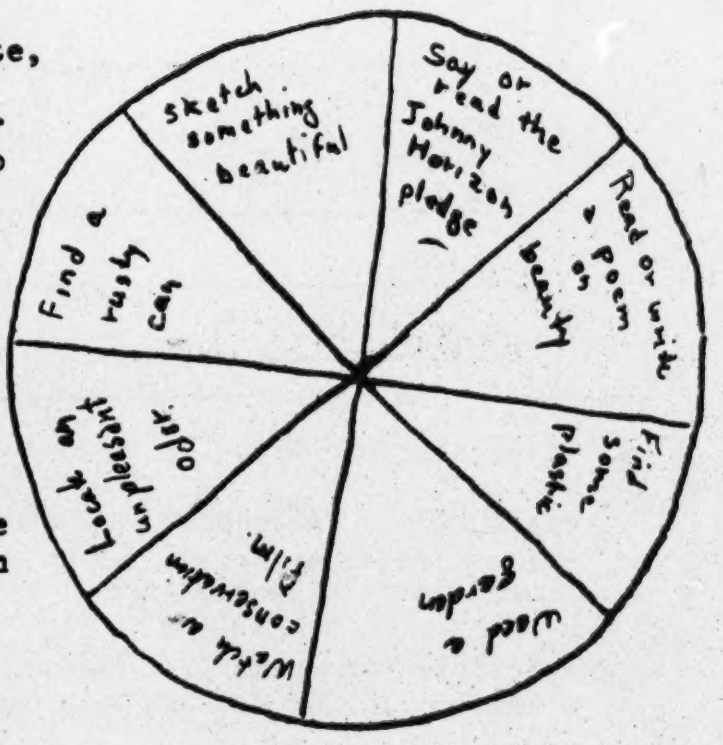
materials - card or paper, pencil to mark or something from nature to mark appropriate square, i.e. stick, pebble, grass.

Find a Returnable Bottle.	Water a plant.	Walk on an errand.
Pick up litter.	pick up an aluminum can.	Find a pleasant odor.
Return a bottle.	Locate some air pollution.	Buy soft drinks in returnable bottles.

II. F.

5. Activities (con't.)

2) You're It - Draw a large circle and divide it into 8 or more sections. In each section write, sketch or paste pictures of things to do &/or locate. Gear the instruction - questions to your curriculum, students and available resources. (Maybe your students can give some suggestions for questions.)


Say or read the Johnny Horizon pledge
Read or write a poem on beauty
Find some plastic
Used a garden
Make a conservation film
Look at unpleasant odor
Find a rusty can
Sketch something beautiful

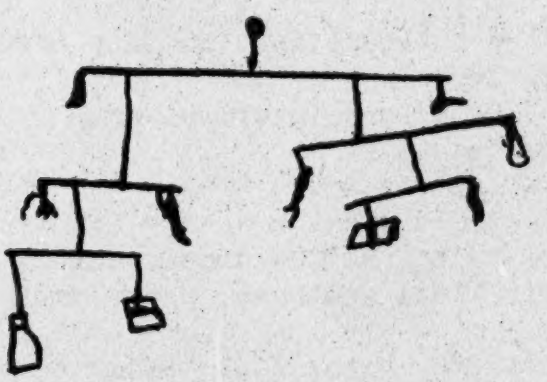
Push a straight pin into the middle of the circle & put a paper clip over it. Have each student take a turn spinning the paper clip. He follows the instructions in the section in which the paper clip points.

Materials - large paper or poster board, compass (or draw circle by hand), pencil, straight pin, paper clip.

3) Litter vs. Litter Mobiles: (a) Attach pieces of litter or cutouts of things not desired in our outdoor environment to string and the string to sticks or wire. (b) Attach things of beauty, contentment, enjoyment from nature to string to sticks or wire. Hang where all can view, discuss and admire.

materials - litter, stiff paper or cardboard for cutouts, string or thread, sticks or wire coat hangar lengths - varying from 12" to 6".

Sample:



5. Activities (con't.)

4) Make a chart of things the students observe.

What Man Does That is Good	What Man Does That is Not Good
Soil	
Water	
Air	
Plants	
Animals	

c. Materials and Definitions

Vocabulary - Use activity and discussion words (man, think, reason). While precise definitions are not needed, students should be able to understand the above words.

Materials vary according to which activities the teacher chooses. A materials list follows each activity explanation.

d. Time and Place

Any time - try same activities at different times of a particular day, or different temperatures or air conditions, or different seasons.

Place - Some activities may be done in a natural setting and some in the classroom. It would be advisable if the teacher would use both settings.

Length - It is suggested that the teacher carry out these activities over a period of several days or weeks and that the maximum length of any one day's activities be no longer than one hour.

6. Related Curriculum Activities

As mentioned in the introduction, outdoor education is not just another curriculum, it is largely a method in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

a. Physical Education - plant and care for trees, vegetable and/or flower garden. Hike; set up cross country course in natural area; campcraft activities, cookouts; overnights.

b. Recreation - Picnic, hike, fish, swim, summer and winter sports, take photographs, read about nature, listen to nature (in the outdoors and/or on records), play nature games. Snow sculpture - Have students

6. Related Curriculum Activities (con't.)

make designs with snow, water and food coloring - animals, humans, plants, caricatures, model town, etc.

c. Music - Listen to nature; try to <u>create</u> sounds of nature; listen to phonograph and/or tape recordings of nature sounds or music and/or songs about nature; make up songs &/or music about nature - conservation and pollution, beauty, etc.

d. Art - Draw or sketch a mural of beauty and non-beauty (litter, smoke, poisons, etc.) in a natural setting; observe nature's colors in different seasons; have fun with shadows; allow your students to be creative - drawing, sketching, cutting, constructing, etc. Find an outdoor area needing cleaning up and/or beautifying - clean it, plan changes, carry out changes - plant a tree, plant a flower garden prettily arranged - take care of as needed.

7. Evaluations

(Check appendices for sample instruments)

a. Check list
b. Fill-In, Drawing, Sketching, Writing
c. Objective
d. Subjective
e. Teacher Comments on Behavior
f. Verbal Tests of Students Knowledge

8. Suggested Further Activities

a. Repeat same activities covered, only in different areas (park, home, playground , etc.) Compare, discuss.

b. Carry out activities not already carried out.

c. Add similar activities and/or change activities for repeating concepts.

d. Continue with Mini-Exploration Guides.

e. Encourage students to do similar activities on their own, with friends and/or family.

f. Encourage the FUN aspects of exploring and observing.

g. Keep records of a specific area - changes day to day; week to week; or different seasons - as to soils - temperature, colors, textures, movements, etc.

h. Find an area needing change - plan and carry out changes, keep up the area - pick up litter, then landscape, weed, water, invite others to view and use.

9. Resources

The following listing will be updated as additional materials are received and/or reviewed by the Handicapped Children's Nature Study Center. In addition please consult the appendices and the I.M.C. book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available from the H.C.N.S.C.

a. BOOKS

Ben Franklin of Old Philadelphia
Cousins, Margaret

Child's Garden of Verses, A
Stevenson, Robert Louis

First Book of Conservation, The
Smith, C. F.
Franklin Watts
New York, 1954, 68 pp.

Flash, Crash, Rumble and Roll
Branley, Franklin M.

Science in Your Own Back Yard
Cooper, Elizabeth K.
Harcourt, Brace & Co.
383 Madison Avenue
New York 17, New York
1958, 192 pp., $3.00

b. CHARTS, POSTERS, FLASHCARDS

"This Is Your Land - Keep It Clean!"
Johnny Horizon
U.S. Dept. of the Interior
Bureau of Land Management
Washington, D. C. 20240
or, your regional office

Conservation chart
U.S. Dept. of the Interior
Washington, D. C. 20240

Air Pollution chart
American Association of University Women
Sales Office
2401 Virginia Avenue, N.W.
Washington, D. C. 20037

9. Resources (con't.)

c. FILMS, FILM-STRIPS, SLIDES

"I'm No Fool Having Fun", color, 8 min.
Walt Disney Production
Educational Film Division
350 S. Buena Vista Ave.
Burbank, California 91503

"I'm No Fool in Water", color, 8 min.
Walt Disney Production
Educational Film Division
350 S. Buena Vista Ave.
Burbank, California 91503

"Little Smokey", color, 14 min.
United States Dept. of Agriculture
Motion Picture Service
Washington, D. C. 20025

"Rickey's Great Adventure"
Film No. 777, Atlantis Productions
Primary, 11 min., color, $125.00, Rental $12.50
Hank Newenhouse, a Div. of NOVO
1825 Willow Road
Northfield, Illinois 60093

"Susan and the Forest Fire"
Society for Visual Education
1345 Diversey Parkway
Chicago, Illinois 60614

"Sonny Squirrel and the Pine Trees"
Society for Visual Education
1345 Diversey Parkway
Chicago, Illinois 60614

"Taking Care of Things", color, 11 minutes
Coronet Films
65 E. South Water Street
Chicago, Illinois 60601

"The Meaning of Conservation" - Film-strip
McGraw-Hill Book Co., Inc.
330 West 42nd Street
New York 36, New York

"The Muddy Raindrops" - Film-strip
Society for Visual Education
1345 Diversey Parkway
Chicago, Illinois 60614

II. F.

9 Resources (con't.)

d. MAGAZINES

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The
State of New York
Department of Environmental Conservation
Albany, New York 12201

National Geographic
National Geographic Society
Washington, D.C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

Nature and Science
published for the American Museum of Natural History
by the Natural History Press
A Division of Doubleday & Company, Inc.
Garden City, New York 11530

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

e. PAMPHLETS, BOOKLETS

You Can Be A Conservationist
Randall, C.E.
American Forestry Association
919 Seventeenth Street, N.W.
Washington, D.C. 20006

II. F.

9. Resources (con't.)

* Man and His Endangered World
Channing L. Bete Company, Inc.
Box 112
Greenfield, Mass. 01301
25¢ each

* Nature Poetry
Cornell Science Leaflet
Vol. 57, Number 3
March 1964, 25¢ each
New York State College
of Agriculture
Cornell University
Ithaca, New York

f. PHONOGRAPH RECORDINGS

"Forest Murmurs" - from Siegfried, Richard Wagner
Discovering Music Together,
Music for Listening, Fowlette Publishing Co.

"Morning" - Peer Gynt Suite, Edward Creig
Album L400
Discovering Music Together, Music for Listening
Fowlette Publishing Co.

g. MISCELLANEOUS - PACKETS, ETC.

Conservation pledge cards
Soil Conservation Service
Local district office OR
U. S. Dept. of Agriculture
Washington, D.C.

* "Meet Johnny Horizon" - Kit
Bureau of Land Management
Local regional office OR
U.S. Dept. of the Interior
Washington, D.C.

* Leaflet listing lapel buttons, decals, posters, etc. Anti-litter campaign.
Keep America Beautiful, Inc.
99 Park Avenue
New YOrk, New York 10016

* "The World Around You - Our Natural Resources Educations Packet"
Garden Club of America, The
Conservation Committee
598 Madison Avenue
New York, New York 10022

Environmental Materials
American Association of University Women
Sales Office
2401 Virginia Avenue, N.W.
Washington, D.C. 20037

III. COMPREHENSIVE OVERVIEW OF SIX COMPONENTS OF OUR ENVIRONMENT

A. Aim

To explore our environment as a whole through using our senses at different times of the day and during different seasons.

B. Purpose

To use all five of our senses, individually and/or in combinations in exploring our environment as a whole (all six components interacting with each other).

C. Educational Objectives

1. Each student should observe how all six aspects of the environment affect each other.

2. Each student should find at least one way in which:

   a. Air does something to soil, water, plants, animals and man.

   b. Soil does something to air, water plants, animals and man.

   c. Water does something to soil, water, plants, animals and man.

   d. Plants do something to soil, water, air, animals and man.

   e. Animals do something to air, soil, water, plants and man.

   f. Man does something to air, soil, water, plants and animals.

D. Concepts

1. Each part of the environment depends upon or helps each other part.

2. The study of all parts of the environment helping all other parts is called ecology.

3. Our lives and those of future generations depend on the wise use of our natural resources.

III. Comprehensive Overview

E. Activities

1. Suggested Lead-Up Activities

a. Carry out Guide I & II. A, B, C, D, E, & F of Unit II.

b. Discuss the particular activities your group is going to carry out - methods, materials and behavior in the out-of-doors.

c. Discuss the word ecology: the study of the way all things help each other and need help from each other.

d. Look through books, pamphlets, magazines, etc. for varieties of air, soil, water, plants, animals, and man.

e. View films, film-strips, and/or slides of varieties of air, soil, water, plants, animals and man.

2. Activity Procedures

The following activities are all related to understanding the inter-relationship of all resources. It is suggested that the teacher choose the activities which are most practical and feasible for her particular students. Ideal group size is 6-8. Groups larger than that should have a teacher aide so that no leader is responsible for more than 8 and preferably no more than 6 students. This enables all in one group to observe an item together.

a. Observing a Square Yard - Have students in groups of 2-4 mark out a square yard with four lengths of string (or use sticks), (or it could be a circle). Have each person take a turn observing (feel, look, hear and smell) what's in that area - soil, plants, animals, air, water, man. Compare different group lists.

materials: 3 foot lengths of string (4 for each group)
Pencil, paper, clipboard, Or Memories
Variety of outdoor areas - playground, vacant lot, woods, streamside, lawn, etc.

III. Comprehensive Overview

E. Activities (con't.)

b. Terrarium - (please refer to appendices for materials and directions for making) - Make several, perhaps a variety of shapes and sizes and place them in different areas (closet, sunny window, artificial light, etc.). Observe, compare. You might want to use them for short term cages for small animal observations.

c. Ecology Chart - Have the students fill in a chart on ecology. What do the components in the vertical column do to or for the components in the horizontal column? Perhaps, for an evaluation activity, you could have the students fill the chart again as a post activity.

	AIR	SOIL	WATER	PLANTS	ANIMALS	MAN
AIR						
SOIL						
WATER						
PLANTS						
ANIMALS						
MAN						

III. Comprehensive Overview

E. Activities (con't.)

d. Rotten Log Observation - In small groups with teacher &/or teacher aide(s) have students observe (look, feel, smell) an old rotten log. This is done best in the out-of-doors where the log is found; enabling observation of the surrounding environment. But since rotten logs aren't always available they may be observed in the classroom. Use hand lenses to observe small plant and animal life. What has caused the tree to die? How long has the tree been dead? Where is the material going? What other types of things are found in and/or around the rotten log?

materials: Rotten log or stump,
Hand lenses
White paper on which to put small things to observe
In the classroom - a piece of rotting wood (if possible return the remains to the original environment).

e. Tree Planting - Have students plant a tree, care for it and keep a log of the area (soil, plants, animals, air, man) for the entire school year; and perhaps during the summer.

materials: Tree ready for transplanting
Area to put it
Shovel, water, hoe
Stakes (to keep lawn movers & feet away)
Notebook, pencil

f. Tiny Gardens - In the bottom of a pie tin or heavy aluminum foil put a layer of small pebbles, some sand and then some woods soil full of humus. Collect some tiny woods plants (get permission, if needed), or tiny twigs, pebbles, flowers, butterflies, moss, bees, etc. for a make-believe garden. Moisten live plants some so they will grow. Encourage the students to design their garden creatively. Place in sunlight similar to natural environment. Observe slow, rapid growth, beauty, creativeness, etc. Show to other classes; help them to do similar tiny gardens.

materials: Pie tins or heavy aluminum foil
Supply of pebbles, sand humus, tiny woods plants
&/or, Tiny twigs, flowers, butterflies, moss, bees, etc.
Water

III. Comprehensive Overview

E. Activities (con't.)

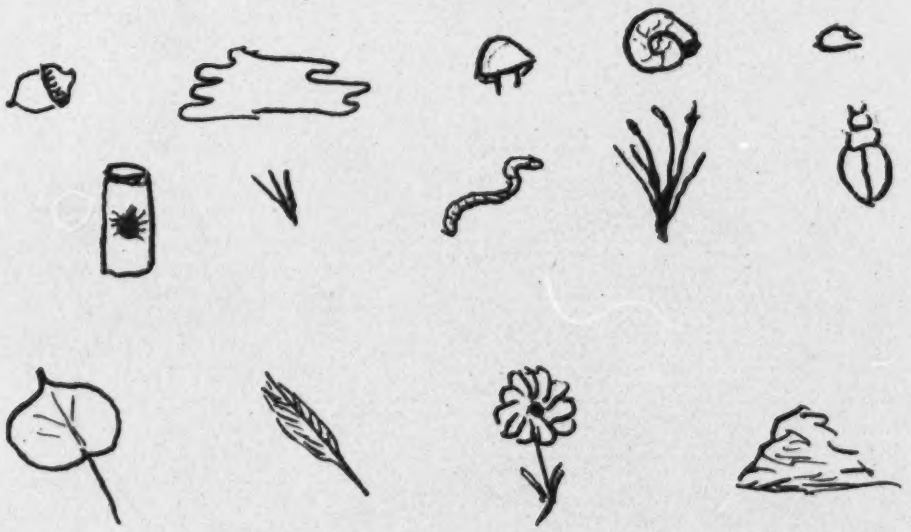
g. Riddles - Have students make up riddles stating and explaining the six components (natural resources) of our environment. Perhaps the students would like to present their riddles to other classes, to the school and/or local newspaper. Perhaps the riddles can be made into posters (illustrated) and displayed throughout the school and/or local businesses, library, museum, etc.

materials: Pencil, paper, poster board or large heavy paper for display.
Paints, crayons or felt marking pens

h. Kims Game - Place about 20 (or number suited to your group) nature objects on a table or on the floor. Put a cover over them. Divide the class into small groups, or have them come individually. Have each group, or individual, come to the table or floor. Remove the covering for one minute, allowing the student(s) to observe the objects. Then they go back to their place and write down as many objects as they can recall. Each object might be worth one point. Perhaps the groups would like to take turns collecting and arranging the objects; and, they they might even like to be "cover removers", "replacers" and "timers".

materials: 20 (+ or -) nature objects
Cover (old sheeting or something to cover objects)
Timer (1 minute, or use wrist watch or count by 1 one thousand, etc.)
Paper & pencil, or chalk & board for recording points

Sample:



III. Comprehensive Overview

E. Activities (con't.)

i. Stake Your Claim - Divide class into groups of two or three (or up to 6 with teacher aide if younger students). Give each student in a group a six foot long string and have them tie the ends together to make a large circle. Place on the ground and put stones or twigs on it to hold it in place. Have each group appoint a secretary for their "claim". Assign others different components of the area (air, soil, water, plants, animals, man), and have them report to the secretary every single thing they can find in, on, or above their "claim". If the name for something found is not known, the player should make up a descriptive name for it.

After a specified length of time compare the group lists. Which team had the richest "claim"?

materials: 6 foot length of string - 1 for each student
Paper, pencil, clipboard
An outdoor area, or a different environment for each group (meadow, woods, lawn, vacant lot, stream, etc.).

j. Shape Hunt - Have players learn the shapes meant by the words such as star, crescent, oval (or ellipse), triangle, octagon, hexagon, oblong (or rectangle), spiral (or helix). Then have them try to find some natural object that is somewhat like each of these shapes. You don't have to collect each item - note it's description and location. Things can be created, a display could be made.

materials: Various shapes (paper or cardboard cutouts or educational materials), paper, pencil, clipboard.

III. Comprehensive Overview

E. Activities (con't.)

k. You're It - Draw a large circle and divide it into 8 or more sections. In each section write, sketch or paste pictures of animals, air, water, plants, soil and man to be located. Gear the instruction - questions to your curriculum, students and available resources. (Maybe your students can give some suggestions for questions.)

Push a straight pin into the middle of the circle and put a paper clip over it. Have each student take a turn spinning the paper clip. He follows the instructions in which the paper clip points.

If some items aren't available or you don't care to have them brought to school, use book and magazine pictures, or have students note location, description or make a sketch, or have samples on a table and have students point to or pick up correct item.

materials: Large heavy paper or posterboard
Compass (or draw by hand)
Pencil, paper clip, scissors
Natural resources according to questions & instructions
Or picture books & magazines

Sample:

III. Comprehensive Overview

E. Activities (con't.)

1. Sing! - America, America The Beautiful. Write about the natural resource thoughts these and/or similar songs bring to mind. Act out these and/or similar songs. Discuss how beautiful America's nature is. Is it staying that way? Is there any way we can improve it?

m. Let-Them-Alone Hunt - Divide the class into groups of six to eight. Give each group a list of things common to the area that might be observed on the hunt.

The hunters explore as a group. As soon as a player spots an item on the list, he shouts it out and his group gets the credit. (Or, have them raise their hand). Easy to spot objects count one point; rarer objects two or three points. Or, just have items noted quietly and marked off list; total points as before. Perhaps all groups will be winners.

materials: Lists, pencils, outdoor area.

Sample list:

Shelf fungus	Angle worms	Poison ivy
Grey lichen	Birds nest at eye level	Carpenter ants
Mushroom	White flower	Fern
Animal tracks	Squirrel home (summer &/or winter)	Trickle of water
Tree stump more than 1 foot in diameter		

r. Nature Scavenger Hunt - Check items off list when found, but do not pick and bring back. Or, list only those items that are in profusion, and that are permissible to pick, collect, etc. Stress conservation, private property, park regulations, etc.

materials - list, pencils

Sample list:

Fir cone	Round seed	Skinny pebble
Heart shaped leaf	Feather	Red pebble
Shed bark	'Helicopter'	Long leaf
Sand	Location of some moisture	Piece of rust

III. Comprehensive Overview

E. Activities (con't.)

o. Treasure Hunt - Have clues posted in certain areas and when found give directions of where to go next and what to look for. Have a common last meeting place for all groups. Perhaps it could be arranged to have a forest ranger, a state conservationist, or a local hobbyist meet the group with a display; and/or have apples to roast, sack lunches or lemonade for all. Share your experiences and observations. If items have been collected for observation, see that they are returned to their own environment. Groups should be small (6-8) and perhaps accompanied by a teacher aide.

materials: Various colors of paper for clues
Trash bag for lunch sacks & clues (unless clues are saved).

Sample Clues:

Station 1 - Going toward the pond stop under the widest pine tree. Measure the circumference of the tree 3 feet up from the ground. Take that many steps backwards toward the school. Find station 2 attached to the branch of a cottonwood tree at shoulder level.

Station 2 - What color is the bark of the top branches of this tree? The trunk? What shape is the stem of a leaf? Now walk 27 feet west to a sandy spot.

Station 3 - What are the colors and/or shades you can see in the sand? How many different types of invertebrates can be observed in the sandy spot? Go to the nearest large (3 feet) rock.

p. Nature Far & Near - Make a list of 20 or 30 items to be located along a particular route with a score for each, such as:

Bird's nest - 10 points	Paper litter - 7 pts.
Live grasshopper - 5 points	Spider web - 15 pts.
Frog - 25 points	Moss - 10 pts.
Domestic animal track - 8 points	Smoke - 12 pts.
Spring water - 12 points	Sumac berries - 10 pts.
Chunk of clay - 5 points	Ant - 3 pts.

materials: lists, pencils, natural area

III. Comprehensive Overview

E. Activities (con't.)

q. Observation Lotto (Indoors &/or Outdoors) - Make up cards similar to the sample for your particular local outdoor area. (Perhaps your students could make cards and trade with each other, or one group for another). In small groups look for the items in your area. As they are noted mark the appropriate square. As in bingo or lotto, the first to fill a row horizontally, vertically or diagonally wins. Or, have someone shuffle the cards with pictures or names of items and show or call out to the class (if inside). Or, photographs and/or slides can be used similarly.

materials: Cards, local natural area
Or, cards, photographs, slides, magazines & books with pictures.
Pencils, beans, twigs or something to mark the squares.

Sample:

MOSS	WHITE SAND	PICTURE OF WIND STORM
ACORN	ANT	JAR OF CLEAR WATER
FEATHER	DANDELION LEAF	GREY STONE

r. Oddities - Take a walk or ramble through a familiar or new natural area and have students look for unusual or odd things in nature. Encourage observation as well as imagination. Look for unusual colors, shapes, sizes, etc.

materials: Familiar or new natural area, imaginations.

Sample items:

Natural bridge tree
Bark with 'animals' in it
Stones shaped &/or marked as animals
Varied colored soil
Wierd shaped knotholes
Twin tree trunk
Litter, trash
Eroded areas
Leaves with galls
Nuts &/or bark gnawed by rodents

III. Comprehensive Overview

E. Activities (con't.)

s. Building An Environment - Have students look for plants, animals, soil, evidence of man, water and air then describe via paint or crayons on a mural and/or construct a similar environment in a terrarium.

materials: Long wide paper for mural
Pencils, paints &/or crayons or felt markers
Natural resources to observe
Terrarium - please refer to the appendices for materials and directions

t. From Where I Sit - While sitting quietly observing and absorbing a natural area of beauty have your students take turns naming one thing at a time that he can see from where he sits which has not been named before. You might alternate items, one per component - air, soil, water, plants, animals, and man. Remember what is beauty to one may not necessarily be beauty to another. Note different colors, shapes, shades, silhouettes, sounds, odors, textures, etc.

materials: Natural area
Five senses

u. Nature Collage - Have students collect a variety of common, interesting, natural outdoor objects - twigs, moss, pebbles, grass, leaves, seeds, nuts, cones, burrs, acorns, etc. Be sure it is alright to collect these items. Have each student place his objects on a piece of cardboard and arrange them creatively as desired.

When the final arrangement is reached have the student glue each object into place. Display in your classroom, in the hallway., in other classes, etc.

materials: Permission to collect in the natural area
Cardboard
Glue
Imagination
Creativity
Twigs, moss
Pebbles, grass
Leaves, seeds
Nuts, cones
Burrs, acorns
Galls, etc.

III. Comprehensive Overview

E. Activities (con't.)

v. Trail Reading - Have small group of students (with teacher aide, if needed) leisurely walk through a natural area to observe as many things as possible (air, soil, water, man, plants, animals). Do not tell or imply that it is to be a test. At a meeting place have them answer several (maybe 10) questions based on what they have (or should have) observed along the way. Then walk back over the trail and verify the answers. Repeat during different seasons.

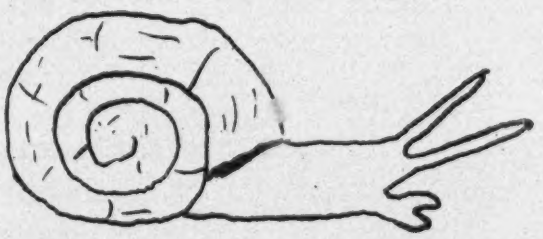
materials: Paper, pencil, clip board
Meeting place in the natural area
Memory - observe through the senses

w. Rainbow Hunt - On a leisurely walk through a natural area have individuals or small groups with a teacher aide keep lists of all the different colors (and shades) each sees on the hunt. Observe for colors of one particular component and/or of the total environment. At a meeting area compare lists to see how many different colors were seen. Compare colors observed during different seasons; in different types of areas.

materials: Pencil, paper, clipboard
Meeting area in the natural area

x. Treasure Walk - While walking through a natural area have each student look for a special treasure. It should be something interesting or beautiful which the student would like to remember and share with others. This is to be a mental picture - no collecting. Items may be touched gently. Sketches may be made, poems and/or songs created. As the group gathers together have each share his treasure with the others.

materials: Charcoal &/or pencil
paper, clipboard
Natural area
Memory
Five senses



III. Comprehensive Overview

E. Activities (con't.)

y. Color Walks - While on a walk through a natural area have each student in a group look for objects that are of a particular color. Assign one color per student. Or, have one group per color. Or, have all groups look for one color and compare notes. On a second walk through the same area look for another color and/or the same color. Keep the lists. Which colors are nature's favorite(s)? Do the favorites change with the seasons? With different areas? (meadow, stream, woods, playground, etc.)

materials: Natural area(s)
Pencil, paper, clipboard

z. Progressive Hike - Place numbered quests (notes) throughout an outdoor area. Each group works together going from one quest to the next doing as the quest requests. Rotate turns as to who leads the group, or the on who finds the quest is the leader to the next spot. Emphasize using the senses in the total environment; encourage the students to use their imagination and variety.

materials: Cards or paper for quests
Outdoor area

Sample quests:

1) Find three different colored soils near this rock. Take 12 half steps in the direction your shadow points and read quest #2.

2) Everyone close his eyes and listen. Identify four natural sounds. Walk backwards to the nearest tree with lichen on the bark for quest #3.

3) Look for signs of insects within 10 feet. If five signs are found, go five paces away from the sun. If less than 5 signs can be found, create a story about why insects do &/or do not live here.

III. Comprehensive Overview

E. Activities (con't.)

3. Materials and Definitions

Vocabulary - Use activity and discussion words. While precise definitions are not needed, students should be abel to understand the concept of inter-relatedness and inter-dependency.

Materials - The teacher should have, either in the classroom or out-of-doors, readily available samples of a variety of several resources existing together, i.e., ants, soil, air, plants; rock, lichen, air, water; and different environments (wooded, open fields, stream, hills, etc.) are desirable.

Other materials vary according to which activities the teacher chooses. A materials list follows each activity explanation.

4. Time and Place

Any time - Try same activities at different times of a particular day, or different temperatures or air conditions, or different seasons.

Place - Some activities may be done in a natural setting and some in the classroom. It would be advisable if the teacher would use both setting.

Length - It is suggested that the teacher carry out these activities over a period of several days or weeks and that the maximum length of any one day's activities be no longer than one hour.

F. Related Curriculum Activities

As mentioned in the Introduction, Outdoor Education is not just another curriculum, it is largely a method in which to carry out other academic teachings as well as a very important area in which to teach carry-over activities and values.

1. Physical Education

a. Do exercises in the out-of-doors.

b. Make up a fairly active game and/or relay using the six components of an environment.

III. Comprehensive Overview

F. Related Curriculum Activities (con't.)

2. Recreation

a. Try a new activity for each season - fall photography, winter snowshoeing, early spring kite flying, late spring fishing, etc.

b. Plan, invite guests, carry out, clean up and evaluate a picnic or cookout for another group (class, younger group, adult guests, etc.).

3. Music

a. Record the sounds of a particular area (stream, schoolyard, tree, meadow, hill, etc.) during different seasons (early fall, late fall, early winter, late winter, early spring, late spring, summer); use the recording with a play, with a mural, etc.

b. Make instruments and make up music illustrating the different components of an environment and/or an area in different seasons.

4. Art

a. Have everyone participate in making a mural of a particular area (school lawn, field, woods, pond, stream, etc.) including all its' components (air, soil, water, plants, animals and man) in its' four seasonal "outfits".

b. Have individuals sketch (charcoal) aesthetically pleasing and also unpleasing aspects of an area.

c. Mobiles- Collect natural materials (get permission first) and/or silhouettes or other cut outs of natural items. Creatively arrange and display in classroom, hallways, at home, etc. Make one mobile representing all the components of a particular environment.

materials: Wire coat hangars
Strong thread
Wire cutters
Scissors
Pencils

III. Comprehensive Overview

F. Related Curriculum Activities (con't.)

5. Dramatics

a. Put on a play involving all six components in all four of the related curriculum areas - physical education, recreation, music, and art: posters, mural, background, music, talking, poems, songs, etc.

b. Stories, Playlets, Pantomines - Have groups make up short stories, playlets or pantomine of different aspects of conservation, litter and aesthetic awareness, outdoor behavior, recreation, etc. Present to the rest of the class, other classes, parents, etc.

G. Evaluations
(check appendix for sample instruments)

1. Check list
2. Fill-In, Drawing, Sketching, Etc.
3. Objective
4. Subjective
5. Teacher Comments on Behavior
6. Verbal Test of Students' Knowledge

H. Suggested Further Activities

1. Repeat same activities covered, only in different areas (park, home, playground, etc.). Compare, discuss.

2. Carry out activities not already carried out.

3. Add similar activities and/or change the activities for repeating concepts.

4. Carry out other Mini-Exploration Guides, if not already don so.

5. Encourage the FUN aspects of exploring and observing.

6. Encourage students to do similar activities on their own, with friends, &/or family.

III. Comprehensive Overview

H. Suggested Further Activities (con't.)

7. Keep records of specific area - changes day do day; week to week; and/or from season to season.

8. Have students re-do the Ecology Chart (E.2.c, page 3) of this guide.

I. Resources

The following listing will be updated as additional materials are received and/or reviewed by the Handicapped Children's Nature Study Center. In addition please consult the appendices and the I.M.C. book and film catalogs as well as your school and local libraries.

* - indicates that the materials are available from the HCNSC for one month loan periods.

1. BOOKS

First Book of Conservation, The
Smith, C.F.
Franklin Watts
New York
1954, 68 pp

Guide to Nature Projects, A
Pettit, Ted S.
W. W. Norton
$4.50

Nature Notebook
Candy, Robert
Houghton Mifflin Co.
Boston, Mass.
1953, 114 pp, $3.00

Partners In Nature
Dudley, Ruth H.
Funk & Wagnalls
New York
1965

Plant & Animal Partnerships
Parker, Bertha M.
Row Peterson & Co.
Evanston, Illinois
1958, 38 pp

III. Comprehensive Overview

I. Resources (con't.)

* Trip To The Pond; An Adventure In Nature, A
Hofmann, Melita
Doubleday
Garden City, New York
1966, $3.95

Wildlife Teams
Friendly, Natalie
Prentice-Hall
Englewood Cliffs, New Jersey
1963

Young Scientist Takes A Walk
Barr, George
McGraw-Hill Book Co., Inc.
New York, New York
1959, 160 pp, $3.00

2. CHARTS, POSTERS, FLASHCARDS

* American Petroleum Industries
1271 Avenue of the Americas
New York, New York 10020

* Gull Lake Environmental Education Project
Kellogg Bird Sanctuary
Route 1, Box 339
Augusta, Michigan 49012

* National Audubon Society
1130 Fifth Avenue
New York, New York 10028

* Society for Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois

* Soil Conservation Service
Department of Agriculture
Washington, D.C.
Or, check your local district

* U.S. Forest Service
Department of Agriculture
Washington, D.C. 20250

OR Your region (Illinois, Iowa, Minnesota, Indiana, Missouri, Wisconsin) 633 W. Wisconsin Ave.
Milwaukee, Wisconsin 52303

III. Comprehensive Overview

I. Resources (con't.)

c. FILMS, FILM-STRIPS, SLIDES

Rickey's Great Adventure
Film No. 777, Atlantis Productions
Primary, 11 minutes, color, $125.00 - purchase, rental - $12.50
Hank Newhouse, A Division of NOVO
1825 Willow Road
Northfield, Illinois 60093

Forest Service
U.S. Department of Agriculture
Washington, D.C. 20250
OR
Your region (Illinois, Indiana, Iowa, Minnesota, Missouri, Ohio, Wisconsin)
633 W. Wisconsin Ave.
Milwaukee, Wisconsin 52303

Write your nearest region or district for catalogs of titles and descriptions.

Sierra Club Films
c/o Association Films, Inc.
25358 Cypress Avenue
Hayward, California 94544

Grand Canyon
Nature Next Door
Glen Canyon
Wasted Woods
Two Yosemites
Wilderness Alps of Stehekin
An Island in Time:

J. W. Wilkie
Continental Machines, Inc.
Savage
Minnesota 55378

The Way of A Trout
The Wood Ducks' World

National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Write for catalog of titles and rental fees.

d. MAGAZINES

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The
State of New York
Department of Environmental Conservation
Albany, New York 12201

III. Comprehensive Overview

I. Resources (con't.)

National Geographic
National Geographic Society
Washington, D. C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

* Natural History
The American Museum of Natural History
Central Park West at 79th Street
New York, New York 10024

Nature & Science
Published for the American Museum of Natural History
By the Natural History Press
Division of Doubleday & Company, Inc.
New York City, New York 11530

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

e. MISCELLANEOUS, PACKETS

* American Petroleum Institute
1271 Avenue of the Americas
New York, New York 10020

* Garden Club of America, The
598 Madison Avenue
New York, New York 10022

III. Comprehensive Overview

I. Resources (con't.)

f. PAMPHLETS, BOOKLETS

* Cornell Science Leaflets — Several titles
New York State College of Agriculture — 25¢ each
Cornell University
Ithaca, New York

* Illinois State Museum Society — Story of Illinois Series
Illinois State Museum — No. 1 through No. 13.

* Iowa State Conservation Commission
300 Fourth Street
Des Moines, Iowa 50319

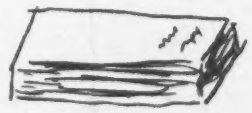
g. PHONOGRAPH RECORDINGS
(Write for listings to the following addresses)

* Columbia Book & Record Library
New York, New York

* Dover Publications, Inc.
180 Varick Street
New York, New York 10014

* Ficker Records
Old Greenwich, Connecticut

* Federation of Ontario Naturalists
Don Mills
Ontario, Canada



* Hayward Recordings, Inc.
11 East Second Street
Mineola, Long Island, New York

* Houghton Mifflin Company
Boston, Massachusetts

* Laboratory of Ornithology
Cornell University
Ithaca, New York 14850

* National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D.C. 20036

* Society for Visual Education, Inc.
1345 Diversey Parkway
Chicago, Illinois 60614

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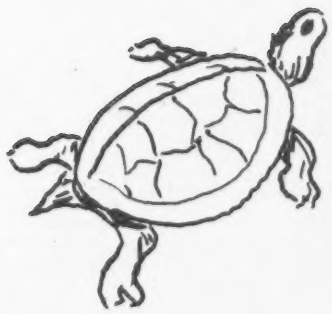

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SHORT TERM CAGES

Invertebrates

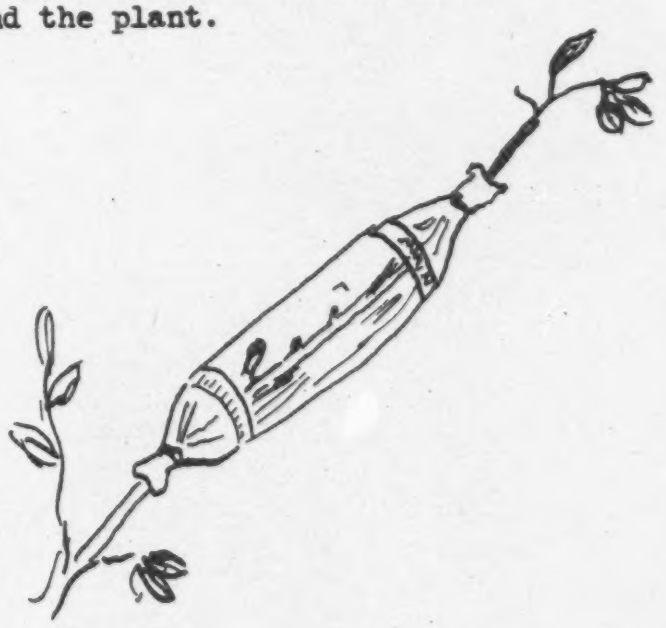
Ants
Beetles
Butterflies
Caterpillars
Crickets
Moths
Spiders
Etc.

Any animal kept for short term observations must be provided with water and food. It is suggested that cages be large with ingredients to approach the natural environment as close as possible. Learn as much as possible about your 'creatures', be patient and take care of them. After the short term (few hours to three days) observation return the invertebrate to its natural environment.

a) <u>Transparent Cage</u> - Moths, Butterflies, Caterpillars

materials: Cellulose acetate, 20" x 25"
Acetate cement
Needle and thread
Muslin or netting

Make the acetate into a long cylinder, about 20". The two edges should overlap about 3/4". Glue the edges together with the acetate cement. Then glue (or sew) a sleeve (12" wide) of muslin or netting to each end of the cylinder. Your 'cage' is ready to be slipped over the feed plant. Tie the two sleeve ends around the plant.



Adapted from:

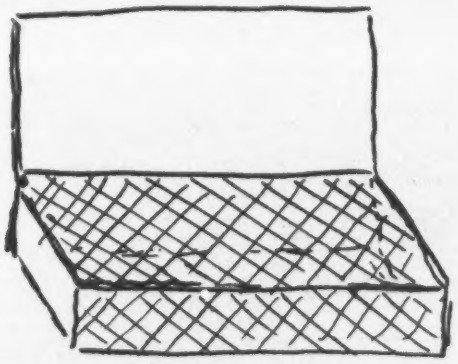
<u>Field Book of Nature Activities & Conservation</u>
William Hillcourt
G. P. Putnam's Sons
200 Madison Avenue
New York 16, New York
1961, 423 pp, $4.95,
page 185.

Cages - Invertebrates (con't.)

b) Wood Box or Cigar Box

materials: Wood box or crate or cigar box or strong cardboard carton
Screening (small mesh)
Heavy plastic
Hinges and screws
Small hook and eye
Hand brace and bit
Screw driver

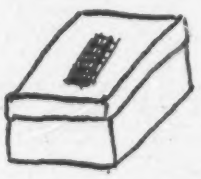
Knock out or cut out one or two sides; cover these with plastic or screening. The top may have a screening or plastic viewing hole also. Place some potted feed plants (or fresh cuttings daily) with larvae on them in the box. The cigar box lid may be hinged and closed with a small hook and eye.



c) Plastic Box - Spider (1 per cage)

materials: Plastic box
Hot knife blade
Glue
Wire screening (small mesh)

Cut the top of a plastic box with a hot knife blade. Glue the wire screening over it for an air hole and for viewing.

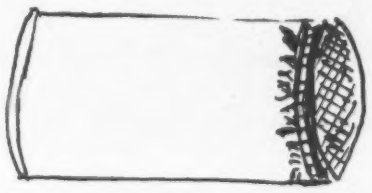


Cages - Invertebrates (con't.)

d) Cylinder

materials: Ice cream container or tin can with bottom in and top out or both top & bottom out
Wire mesh (small) screening or strong plastic
Strong rubber bands or wire

Replace the top and/or bottom of a container with the wire mesh screening or the plastic. Hold in place with the rubber bands or wire.



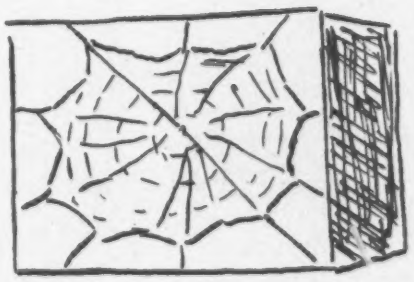
e) Wood Frames - Spider (1 per cage)

materials: Wood frame
Glass or cellophane sides
Glue or tape

Place the glass or cellophane on the sides of the frame and hold in place with glue or tape.

Adapted from:

Spiders and Their Kin
Herbert W. & Lorna R. Levi
edited by Herbert S. Zim
Golden Press
New York, New York
1968, $1.25, page 19



f) Terrariums

Please refer to "Terrarium Case", Bottle Up A Garden", and/or the Aquariums.

Cages - Invertebrates (con't.)

g) Insect Cage

materials: 2 tuna fish cans
Masking tape
Plaster of Paris
Fine mesh wire
Enamel (optional)
Tin snips
Paint brush (optional)

1) Cut the wire mesh into rectangle 10" high and ½" longer than the outside circumference of the can. The circumference may be measured by wrapping a piece of string around the can & measuring its length.

2) Tape the two long edges and one short edge of wire mesh.

3) Mix the plaster of Paris with water and fill one can to a depth of ½".

4) Roll the mesh into a cylinder which fits into one can (long taped edges should overlap); set the untaped edges firmly into the plaster of Paris. Allow plaster to dry.

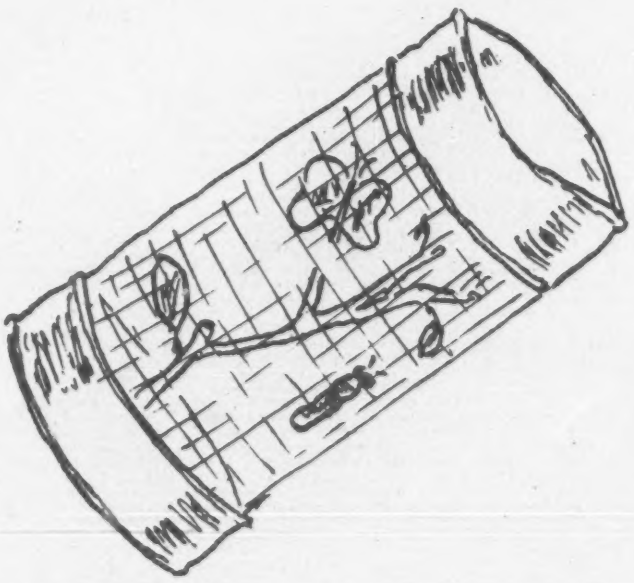
5) Use the second can for the top.

6) Paint the cans with enamel paint (optional).

7) Place twigs and greenery in the cage to perch lady bird beetles, butterflies, caterpillars, etc.

8) Be sure to put a small container of water in the cage &/or sprinkle the greenery with water. The cocoons need 70 - 85' F temperature and high humidity.

Adapted from:
Crafts for Retarded
McNeice and Benson
page 47.



Butterflies & Mothes:
- Honey diluted with water or maple syrup in small container covered with screening to keep insects feet out of it. Keep liquid up to level of screen.
- Lightly sprinkle with water each day.

Common Caterpillars & Leaves Eaten -
Monarch - Milkweed
Cabbage Butler - cabbage & cauliflower
Swallowtail - celery, dill, parsnip & parsley
Sphinx - willow, grape, Virginia creeper, tomato
Wooly Bear (Isabella Tiger Moth) - grass, clover, dandelion

Praying Mantises:
- Fruit flies & aphids - for babies
- Living or live houseflies, moths, caterpillars, crickets & variety of other insects - that it can capture.
- Lightly sprinkle cage plants with water each day.

Beetles:
- Leaves as well as living flesh
- Fresh tree leaves, grasses, lettuce, slices of fresh fruit, bits of raw beef, Offer variety.
- Sprinlke water on bits of the vegetation offered to beetle.

Rotten sticks & rotted wood, &/or rock on floor as well as growing plants.

Cricket:
- grass & clover seed - hatching crickets
- Moist bread, bits of raw apples, & other fruits, lettuce, moist dog biscuits, cake & even fignewtons.
- Sprinkle water on fersh lettuce or green grass each day. (never give water in cap or dish).

Ants:
- Bottle cap of fresh water
- Bits of fatty meat or freshly killed insects
- Small container of syrup thinned with water, honey or sugar water.

Please refer to: <u>Hunting Big Game in the City Parks</u>
for further information
Smith, Howard G.
Abingdon Press
Nashville, Tenn.
$4.95, 1969, 240 pp

ANT JAR:

Put a sealed pint jar in firmly packed, slightly moist earth, inside a large-mouthed gallon jar. Earth should come to the shoulder of the pint jar. On the pint jar, put a small bottle cap, sponge, or moist cotton for a water supply, and a twig for a ladder.

Tie a paper girdle around the big jar for the first few days. As the ants make tunnels, they may cover the pint jar top with surplus dirt. Keep it clear. If you put the jar out of doors, set it in a pan of water so black ants can't climb in and kill the red ants.

GETTING THE ANTS:

A fertile queen is next to impossible to dig up, as she will be several feet below ground level. Three or four dozen ants caught with a large spoon as they come from a nest will make a satisfactory colony which may last for months. Ants from different holes will fight to the death.

FOOD:

Feed them small amounts of weed and grass seeds daily. Rolled oats, occasional beetles and caterpillars are good, but no sweets or grease. Let the ground get dry for better food storage.

ODD FACTS:

As many as 70,000 ants may go in and out of a nest daily. On a hot day (up to 100 degrees) they go 780 feet an hour. Cool days (50 degrees) they go about 52 feet an hour. The clear and use the same roadways for years. A pound of ants may contain 140,000 individuals.

OBSERVATIONS:

1) How many ant nests are in your school yard or camp? Are they the same kind? How close together are the nests?

2) Estimate the traffic from a nest. Count one line for one minute.

3) Follow one ant for 10 minutes. How did he greet others? What will he do if he finds an obstacle in his way? If you change his direction with a straw? If he looses his load? If you put several food items near his path?

4) Does the soil from a nest show different colors? What order of color? What does this tell about the soil under the surface?

5) Check the speed of travel for a 50 foot distance at 9:30 A.M. and at 13:30 P.M. What makes the difference?

6) Itemize the foods brought to a nest in 15 minutes. Do they change with time?

SHORT TERM CAGES

Any animal kept for short term observation must be provided with water and food. The cage should be as natural as possible. Learn as much as possible about your 'creature', be patient and take care of it. After the short term (few hours to 3 days) observation return the 'creature' to its natural environment.

Reptiles and Amphibians

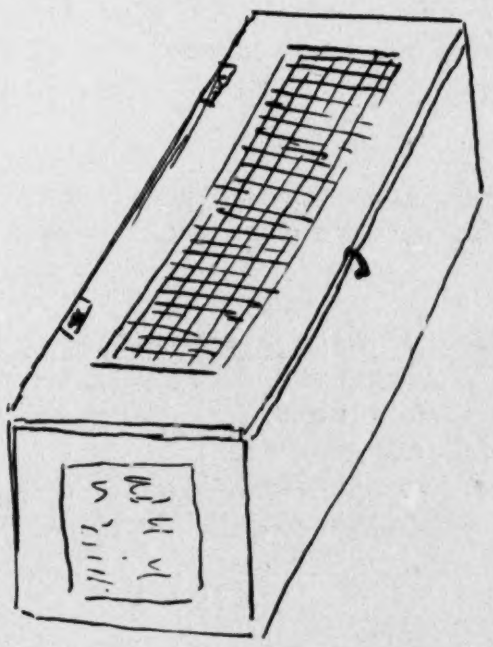
Frogs
Lizards
Salamanders
Snakes
Turtles
Etc.

a) Wood Box - Snakes, Turtles

materials:
- Window screening (preferably brass, copper, or aluminum), small mesh
- Pane of glass or plastic of similar thickness
- Wood box (old apple box), or 6 pieces of ½" to 1" thick wood about 8" to 10" square (Rule: 1 snake long, ½ snake high, ½ snake wide)
- 2 hinges, 8 screws
- Hook and eye
- Hand brace & bit
- Screw driver
- Staples
- Hammer
- Tape (electricians or strong reinforced tape to hold glass to ends)
- Jar lid or similar container for water
- Natural materials to simulate natural environment (small rocks, soil, plants, twigs, pebbles, etc.)

Cut out the top and one or two ends. Replace the top with small mesh wire. Put glass or plastic in the ends. Put the hinges on the back of the top and the hook and eye in the front as in the sample.

Sample:



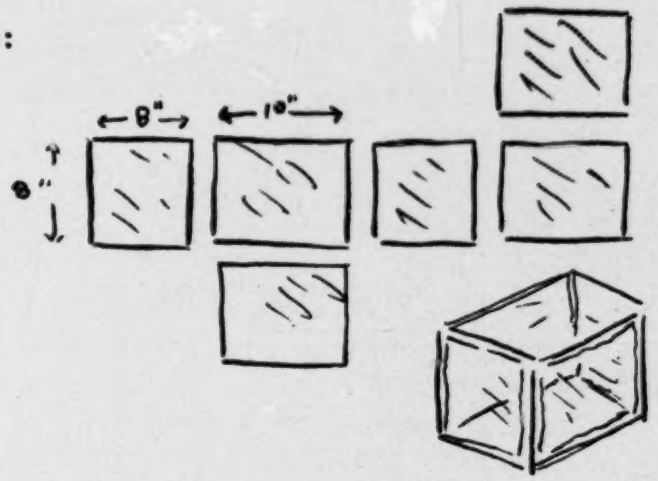
Cages - Reptiles, etc. (con't.)

b) Terrarium Case - frogs, lizards, salamanders, small snakes, small turtles, etc.

materials: 6 panes of glass (window), 6" x 8", 8" x 10", or 10" x 12"). Have 2 of the pieces cut square (6" x 6", 8" x 8", or 10" x 10").
Roll of 2" tape (preferably waterproof) - electrician, adhesive, etc.

Place the six panes of glass on a table as shown. Space them as far apart from each other as the glass is thick. Tape the four side pieces together, then to the bottom piece with strips of tape cut to proper lengths. Reinforce with tape along the bottom and top edges. Place around the edges of the top piece, then hinge this piece into position as a lid with another piece of tape.

Sample:



For a stronger terrarium case - tape only the four sides, then sink their bottom edges into a 1" layer of newly mixed plaster of Paris batter in a baking dish (or similar pan) of suitable size. Let set and dry, then waterproof the plaster with paraffin. Reinforce the top edge with strip of tape. Place a sheet of glass over the case.

For the inside natural ingredients please refer to "Bottle Up A Garden", "Fish Tank Terrarium", and/or the Aquariums.

Adapted from: Field Book of Nature Activities & Conservation
William Hillcourt
G. P. Putnam's Sons
200 Madison Avenue
New York 16, New York
1961, 432 pp, $4.95, pp 266-267

Cages - Reptiles, etc. (con't.)

c) Fish Tank Terrarium - frog, turtle, etc.

materials: Sand, soil, pebbles, small rocks, plants (live or plastic), water, twigs, etc.
Fish tank (purchased or hand made - for materials & directions, please refer to Terrarium Case - b)

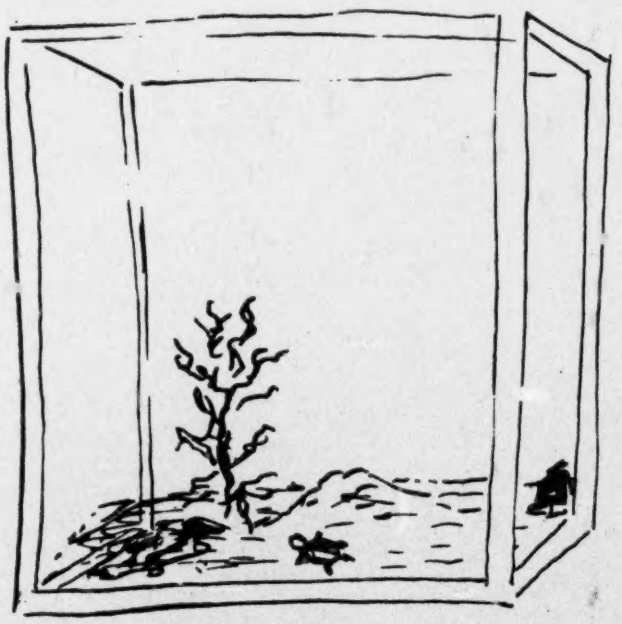
Put about two inches of sand in the bottom of a purchased or hand made fish tank. Push the sand up into a hill at one end of the tank. Put some plants in the sand to shade the pets (plastic plants will do). Now place pebbles, small rocks and soil on the slope. Put enough fresh water into the tank to fill one end, leaving the sand hill dry.

If soil is used rather than sand, put the water in a large dish at one end of the tank.

Place wire screening over the top of the tank to keep the pets from climbing out.

Replace the pets to their natural environment after short (1 to 3 days) observation period.

Sample:



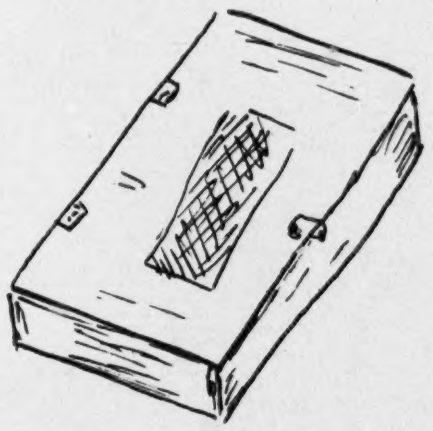
Cages - Reptiles, etc. (con't.)

d) Cigar Boxes - lizards (small), salamanders, tiny snake, etc.

materials: Cigar box
Staples
Screening (small mesh)
Hammer
Hook and eye (small)
2 small hinges and screws
Screw driver
Jar lid or similar container for water and/or sprinkle water on food and/or plants.

Cut out a part of the lid; replace it with screening. Place the hinges on the back of the lid and the hook and eye on the front of the lid as sample shows. The box could be painted or sprayed with lacquer or varnish to last longer - waterproof.

Sample:



FOOD

Reptiles and Amphibians
Etc.

Lizards

Live insects - flies, roaches, grasshoppers, earthworms.

Water - in a dish and/or sprinkled on the plants.

Snakes

Feed every 7 to 10 days:

Small size - chopped earthworms, chopped meat or fish, larvae or grubs, tiny minnows, small tadpoles, salamanders.

Large size - frogs, toads, minnows, shiners, live mice, meat or fish strips.

Turtles

Feed couple of times a week:

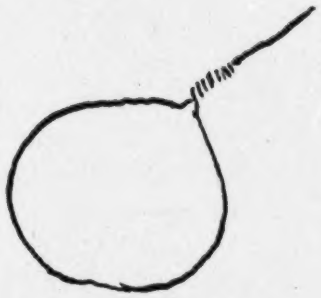
Earthworms, slugs, insects, lettuce, bananas, apples.

DRY LAND NET

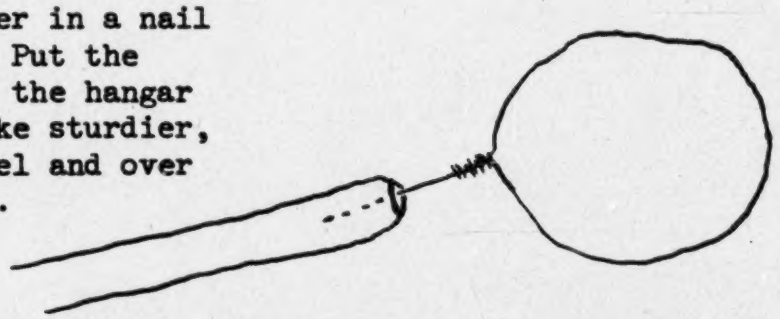
Materials: Metal clothes hangar
Broom handle or 1" diameter doweling - about 4' long
Cheesecloth, netting or old curtain material - 3' x 2'
Heavy duty thread and needle, scissors
Nail and hammer or hand bit and drill
Tape - electrician or adhesive

1) Bend the hangar into a circle

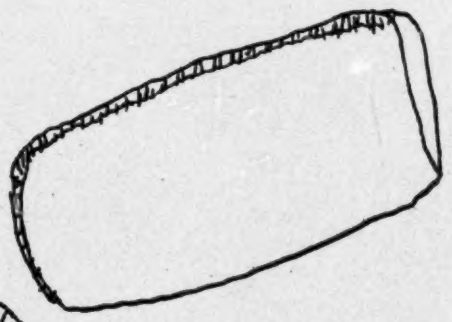
2) Straighten just the hook



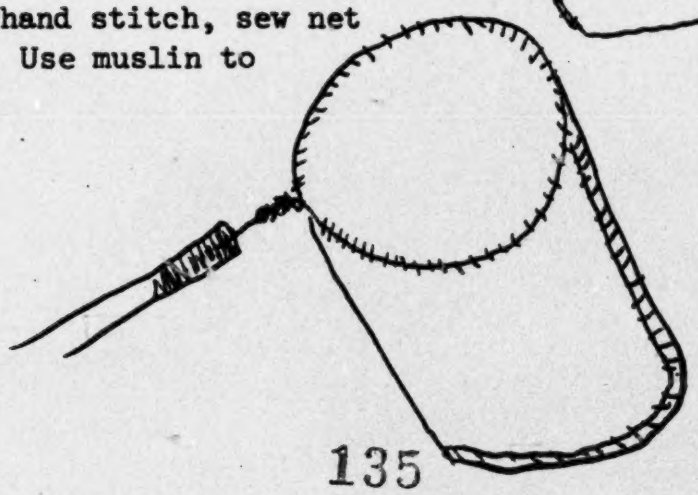
3) Drill a hole in the end of the broomstick (or, hammer in a nail and then remove it). Put the straightened hook of the hangar into the hole. To make sturdier, wrap tape around dowel and over hangar several times.



4) Fold the cheesecloth in half; sew across one end and down the side.



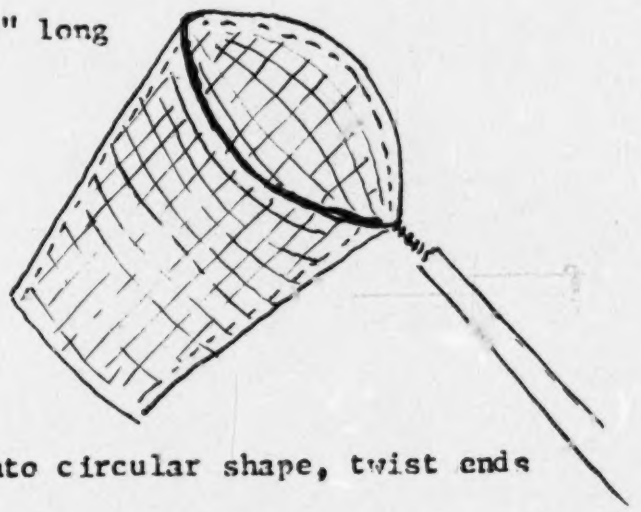
5) Using overhand stitch, sew net to hangar. Use muslin to reinforce.



B U T T E R F L Y N E T

Crafts for Retarded, McNeice, William C. and Benson, Kenneth R., p. 35

Materials: 1/2 yard cheesecloth, mosquito netting
1 wire coat hanger
1/2" dowel or broom handle - 24" long
heavy sewing thread
glue
electricians tape
3/16" twist drill
hand drill
needle
pins



Procedure

(1) Straighten coat hanger and bend into circular shape, twist ends together for approximately 2".

(2) Fold cheesecloth in half and cut off triangular sections as illustrated at 'A' and 'B'.

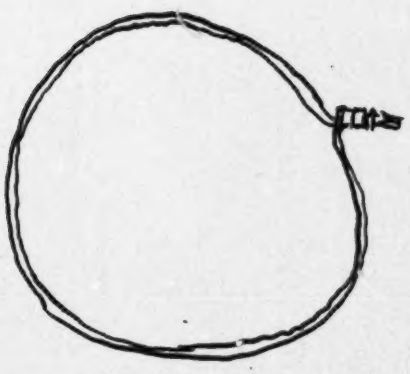
(3) Pin seams along side and sew with heavy thread.

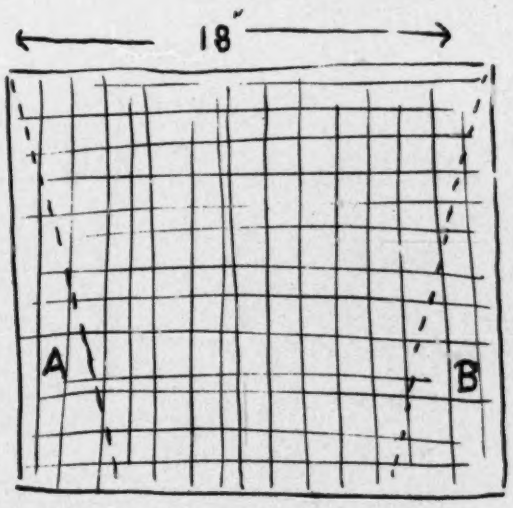
(4) Pin wide end of net in place over circular part of coat hanger and sew in place.

(5) Locate center of end of dowel and drill 3/16" hole 2" deep.

(6) Put glue on the twisted end of wire frame and force it into the hole.

(7) Tape the handle end of the dowel for better hand grip.

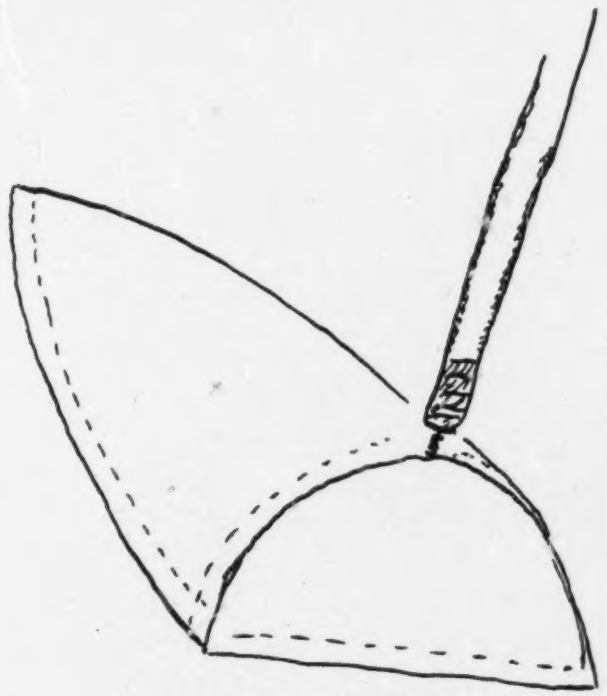




WATER NET

Materials: Wire coat hanger or preferably ¼" coppered steel (rustless)
Sturdy cloth
Needle, Sturdy thread
Scissors, Pliers
Friction (or electricians) tape
Broom handle, or 1" diameter dowelling, about 4' long

Construct as the dry land net. For easier sweeping of the bottom of water form the wire in D - shape as sample shows. Depth of 18" with 12" diameter is sufficient.



Or, use wire kitchen strainers - attached to longer handles.

A couple of white plastic dish pans or white painted pie plates will greatly facilitate observing your catch.

For further information please refer to:

Field Book of Nature Activities and Conservation
William Hillcourt
G. P. Putnam's Sons
New York, New York
200 Madison Ave.
$4.95, 1961, 432 pp

Nature Study Equipment, How to Make and Use It
Sauer, Pauline L.
Univ. of Northern Iowa
Cedar Falls, Iowa
Issue No. 14, revision 1955
38 pp, 25¢

HOW TO MAKE AND CARE FOR AN AQUARIUM

The aquarium may be a very simple affair and still be effective. Almost any glass receptacle will do, glass being chosen because of its transparency, so that the life within may be observed. Tumblers, fruit jars, candy jars and battery jars are all available for aquaria. The tumblers are especially recommended for observing the habits of aquatic insects.

A. Making the Aquarium

1. Place in the jar a layer of sand, an inch or more in depth.
2. In this sand, plant the water plants which you find growing under water in a pond or stream. The plants most available are waterweed, Bladderwort, Water Starwort, Watercress, Stoneworts, Frog-Spittle or Water-silk.
3. Place on top a layer of small stones or gravel to hold the plants in place.
4. Tip the jar a little and pour pond water in very gently at one side to two or three inches of the top; if a jelly tumbler is used, fill to within an inch of the top.
5. Let it settle for a few hours.
6. Place it in a window which does not get too direct sunlight. A north window is best.
7. To get living creatures for the aquarium, use a dip net, which is made like a shallow insect net. (Refer to Water Net).
8. Dip deep into the edges of the pond and be sure to bring up some of the leaves and mud, for it is in these that the little water animals live.
9. As fast as dipped up these should be placed in a pail of pond water.
10. In introducing the water animals into the aquarium, it is well to put but a few in each jar so that each will have ample air and plant food.

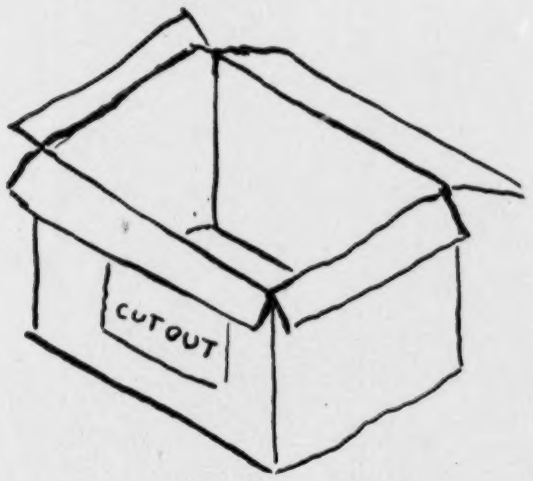
B. Caring for the Aquarium

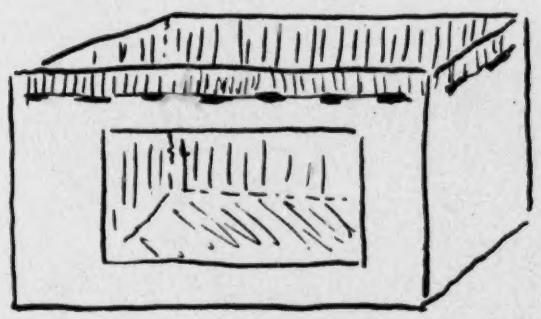
Care should be taken to preserve the plant life in the aquarium, as the plants are necessary to the life of the animals. They not only supply the food, but they give off oxygen which the animals need for breathing. They also take up from the water the poisonous carbonic acid gas given off from the bodies of the animals.

1. The aquarium should be kept where there is a free circulation of air.
2. If necessary to cover the aquarium to prevent insects, like the water boatmen and water beetle from escaping, tie over it a bit of mosquito netting, or lay upon the top a little square of wire netting used for window screens.
3. The temperature should be kept rather cool; it is better that the water of the aquarium should not be warmer than 50 degrees Fahrenheit, but this is not always possible.
4. If insects or animals die, in the aquarium, they should be removed at once as the decomposing bodies render the water foul.
5. To feed the animals that live upon animal food, take a bit of raw beef, tie a string to it and drop it in, leaving the free end of the string outside of the jar. After it has been in a few hours, pull it out - if it remains longer it will make the water foul.
6. As the water evaporates, it should be replaced with water from the pond.

CARDBOARD BOX AQUARIUM

Materials: Sturdy cardboard box (e.g. mimeo paper box)
Roll of masking or packaging tape
1½ yards of medium gauge vinyl sheathing or
10 mil. polyethylene.





1) Fold the tabs of the box inward and cut out a window as indicated in Figure 1.
2) Line the box with the sheathing and tape the remainder at the top and sides of the box as shown in Figure 2.
3) Fill the aquarium to the top of the window with pond water. (Caution - if you must move the aquarium, place a board beneath the box to prevent it from rupturing. Water weighs 8 1/3 lbs. per gal.)

Thus, groups of students can easily have an aquarium or terrarium and the cost to the school is minimal. You are now ready to fill the aquarium with all types of aquatic organisms for study and enjoyment throughout the winter months.

Adapted from ECOLOG Environment Science Center
November 1970, Volume 4, Number 2.

BOTTLE UP A GARDEN

Over a hundred years ago a London physician named Nathaniel Ward discovered that he could grow ferns and mosses inside glass cases. His development, called the "Wardian" bottle, can give adults as well as children hours of gardening enjoyment during the winter months ahead.

Some simple instructions provided by the American Association of Nurseryman can help you develop your own garden in a bottle.

A brandy snifter, a fish bowl, or a large bottle will make a good container (or, to give it the correct name, a terrarium). The size and shape is up to you, although it is good to be able to cover the opening at the top after planting.

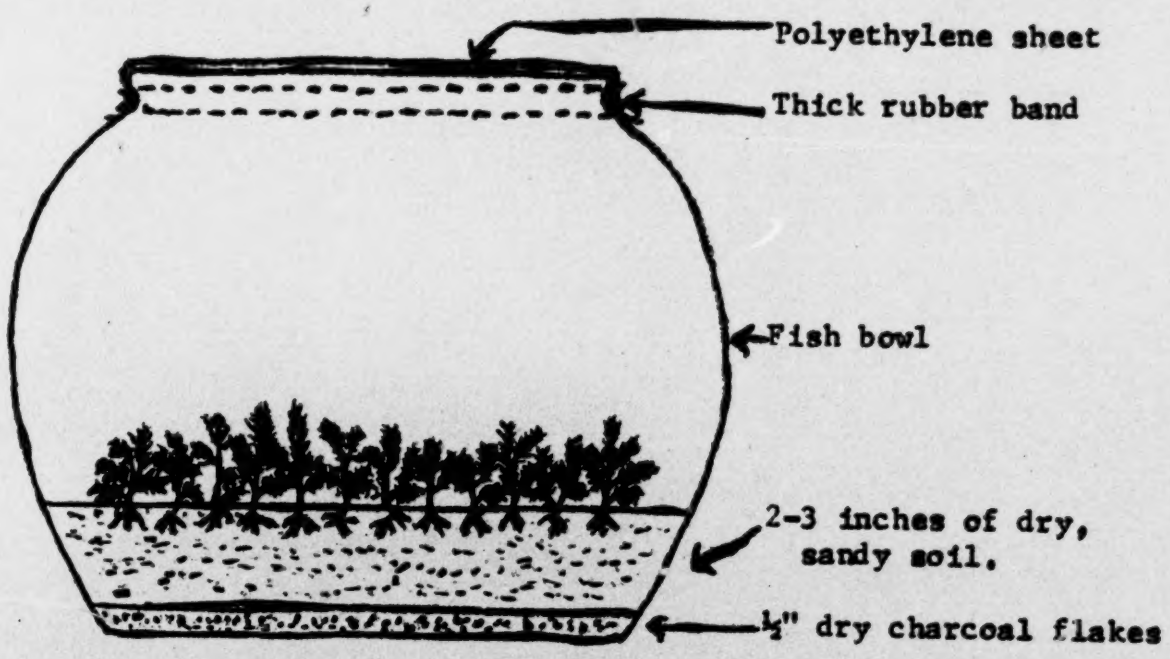
Wash, dry and polish the container until it sparkles. Then pour in a half inch of dry charcoal flakes. On top of that add several inches of dry sandy soil. Some bottle gardeners place moss, green side up, on the charcoal and then add the sandy soil.

Now you are ready for planting. Most small house plants that thrive in a moist atmosphere will be happy in a bottle garden. You may want to use Wandering Jew (Zebrina Pendula), Pellionia, Minature Ivy and small ferns. The Creeping Fig Plant and the Prayer Plant are also wise choices. If you need ideas, seek advice at your nursery or garden center.

The most difficult part in beginning a bottle garden is the actual planting process, which is very similar to constructing a ship inside a bottle. Long instruments are needed to be your "hands" inside the container and handy tools can be created by taping a fork and a spoon to sticks or poles.

After planting the miniature garden you have designed, add water until the soil is damp, then cork up the bottle. The plants will give off moisture which will accumulate on the sides of the container and return to the roots. This "rain" provides sufficient moisture for about a year, and so watering your garden once each 12 months will usually be sufficient.

Locate the bottle in good light, but not direct sun, then sit back and watch it grow.



A garden in a bottle can provide hours of gardening enjoyment during the long winter months. Virtually any bottle shape will do; and with a few easy-to-get materials and once-a-year watering, this minature "terrarium" will thrive in its own moisture - producing atmosphere.

Cedar Rapids Gazette, October 26, 1969

PLANT ACTIVITIES

See It Grow

p. 306, Childcraft, Vol.9

materials - a blotter
plastic or glass drinking glass
peas, beans or radish seeds

Wet a blotter and line the inside of a glass with it. Poke the seeds down between

the glass and the blotter. Put four or five tablespoons of water into the glass each day to keep the blotter wet. Watch the roots, stems and little leaves grow from the seeds. Perhaps transplanting would be a next step.

Window-sill Garden

p. 306, Childcraft, Vol.9

materials - cottage cheese cartons
seeds from apples, oranges, melons, pumpkins, squash
pebbles
soil
charcoal or moss

Poke a hole in the bottom of each cottage-cheese carton. The hole will let excess water drain off. Set the cartons on saucers.

Put pebbles in the bottom of each carton. Put a layer of moss or charcoal over the pebbles. Fill the rest with soil.

Drop five or six seeds on top of the soil in each carton. Sprinkle water on them everyday. Some of the seeds will grow big and strong. Pull out the plants that do not grow well and throw them away. This gives the strong ones more room to grow.

PLASTER CASTING
ANIMAL TRACKS

Materials: Plaster of paris, water, vaseline petroleum jelly, a strip of cardboard 2" wide, paint, and tape

Construction:

1. Place a 2" cardboard collar (coated on the inside with vaseline) around the track, and lightly sprinkle talcum powder into the track.

2. Mix the plaster of paris and pour it into the track. Allow at least 30 minutes to dry.

3. Loosen the ground around the track, and remove enough dirt to carry the negative cast home. Let it dry overnight before removing the rest of the dirt.

4. After cleaning, coat the negative and the inside of another collar with vaseline. Attach the new collar to the negative.

5. Mix plaster of paris and pour into negative mold. Allow at least 30 minutes to dry.

6. Remove the collar and carefully seperate the cast from the mold. Paint the track to make it more distinctive.

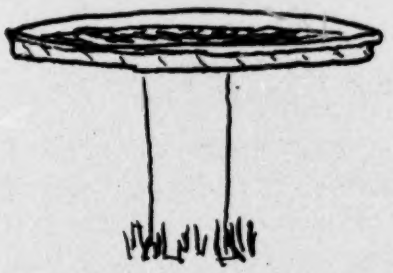
Printed Under An ESEA Title III Grant by
The Central Pennsylvania Outdoor Education Project
112 Recreation Building, University Park, Pa. 16802

BIRDS AND WATER

Bird baths should be no more than three inches deep at the center with sloping sides and the bottom surface should be rough.

Bird baths should be placed in an area somewhat protected from cats; about three feet off the ground with tree branches or shrubs nearby, yet in an open area.

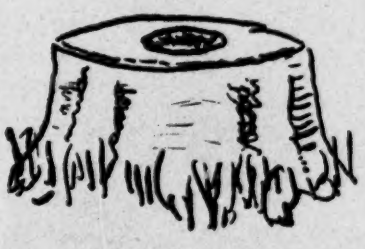
Have your students change the water upon arriving at school, during recess, at lunch time and/or when leaving school - to prevent freezing.



Bird Baths

a) Put an old metal or plastic garbage can lid on the ground or tree stump. Anchor securely. See that the water is fresh every one to two days (or more often, as needed).

b) Keep fresh water in a naturally hollowed out boulder - on the ground or on a tree stump.



c) Hang a bucket with a tiny hole in the bottom two to three feet over a bird bath. The water dripping seems to attract the birds.

d) Ground bird bath - dig a hole, put in layers of cinders for drainage, then two inches of concrete. Fancier ones can be constructed with varieties of rocks, making levels and perhaps even flowing water.

Birds & Water (con't.)

Freezing and Below

Cut a hole in the top of a box so that a plastic bowl will fit into it. (Or, otherwise suspend a bowl in the top of a box). Place an extension cord with socket and light bulb in the bottom of the box under the bowl. Plug into an electric outlet. This will keep the water from freezing.

materials: 6" x 6" box, or suitable size
Plastic bowl
Water
Outdoor extension cord
25 watt light bulb

(Heaters can be purchases in a pet shop, tropical fish store or in a poultry supply house.)

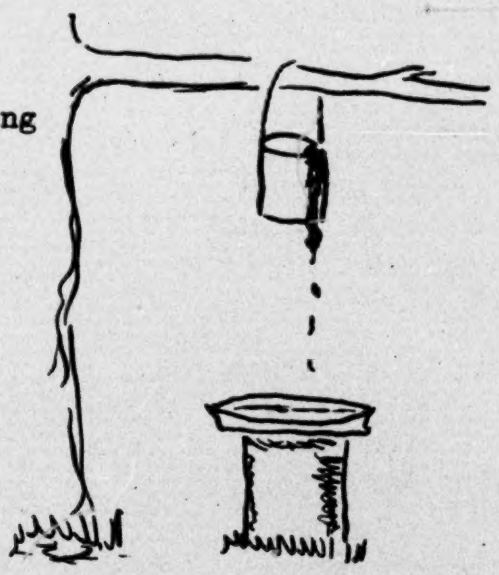
Dust Bath

Prepare a bare spot of ground and cover it with loose powdery soil. As with the bird baths, the dust bath area should be in an area somewhat protected from cats and near some tree branches or shrubs, yet in an open area.

Drinking Fountain

Hang a can from a low branch over a pie tin. Fill the can with water. Place a wick in the water with one end hanging over the side. Water will drip into the pie tin below.

materials: Tin can
Wire or string
Wicking or string
Large pie pan



BIRD FEEDERS

a) Milk Carton

Cut off the cover; punch one hole in each of two sides; tie a string in the holes for a handle; hang from a tree branch or a shrub; fill with wild bird seed.

materials: Quart or ½ gallon milk carton
String
Wild bird seed
Knife or scissors
Paper punch or awl

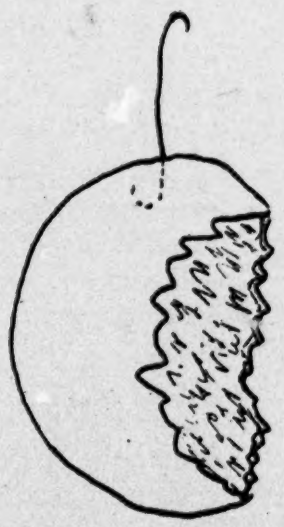
Adapted from:

Birds Eat and Eat and Eat
Roma Gans
Illustrated by Ed Emberley
Thomas Y. Crowell Co.
New York, New York
1963

b) Coconut

Drill a hole in the top of an empty shell; insert a coat hanger for a hook. Place seeds or suet in the side opening; hang from a limb.

materials: Coconut (empty shell)
Wire coat hanger
Wild bird seed or suet
Hand brace & bit



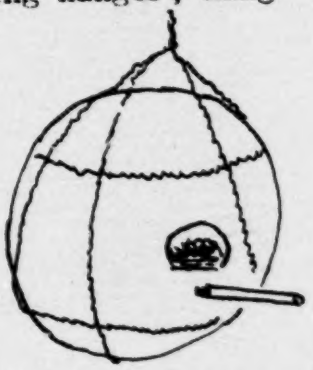
Adapted from:

The How & Why Wonder Book of BIRDS
Robert Mathewson
Illustrated by Walter Ferguson & Ned Smith
A Division of Grosset & Dunlap, Inc.
New York, New York
1960, 48 pp

Bird Feeders (con't.)

c) Rubber Ball Feeder or House

Construct feeder as Coconut (page 1); or, make a smaller hole (1¼") in a side; glue a small dowel perch in a hole about ½" below the opening; make a simple wire or string hanger; hang from a limb.



materials: Rubber ball
Knife
Glue
Dowel (about ¾" to ½" x 3")
Wire or string

Adapted from:

BIRDS, The How and Why Wonder Book of
Robert Mathewson
Illustrated by Walter Ferguson &
Ned Smith
A Division of Grosset & Dunlap, Inc.
New York, New York
1960, 48 pp

d) Seedballs

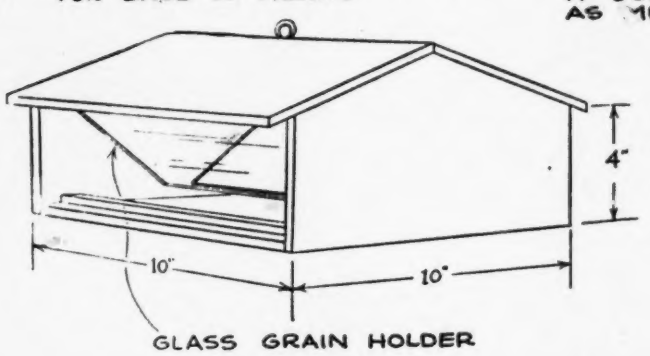
materials: 5 tablespoons ground raisins
4 tablespoons finely cracked corn (or bird seed)
4 tablespoons melted suet
2 graham crackers, crumbled
A little syrup
Use of freezer
Double boiler
Bowl
Fork
String
Mesh bag
Wax paper

Put the raisins, corn, crackers in a bowl, mix well with a fork. Melt the suet in a double boiler; pour into bowl mixture. Add just enough syrup to form a ball. Wrap the ball in wax paper; cool in freezer about twenty minutes. Remove the wax paper and hang the ball in a mesh bag from a branch.

Adapted from:

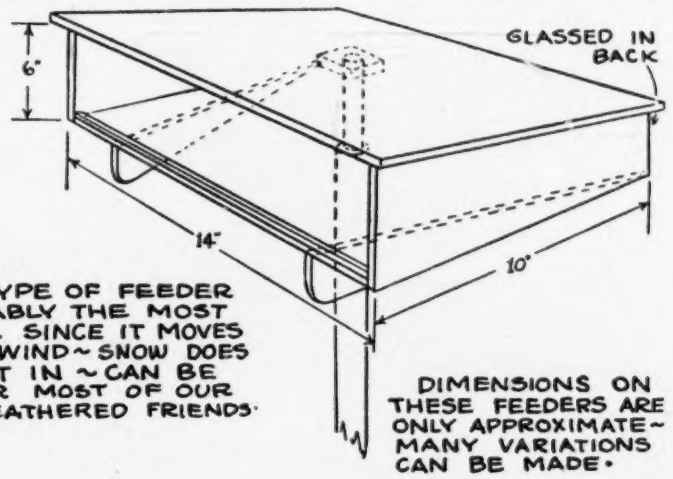
Bird Life, Junior Science Book of
Georgia Pi[redacted]e
Garrard Pu[redacted]shing Co.
Champaign, [redacted]linois
1967, 64 [redacted]

HINGED OR REMOVABLE TOP FOR EASE OF FILLING



GLASS GRAIN HOLDER

THIS IS A LARGE CAPACITY FEEDER AND IS VERY HANDY SINCE IT DOESN'T REQUIRE AS MUCH ATTENTION.



THIS TYPE OF FEEDER IS PROBABLY THE MOST PRACTICAL SINCE IT MOVES WITH THE WIND ~ SNOW DOES NOT DRIFT IN ~ CAN BE USED FOR MOST OF OUR SMALL FEATHERED FRIENDS.

DIMENSIONS ON THESE FEEDERS ARE ONLY APPROXIMATE ~ MANY VARIATIONS CAN BE MADE.

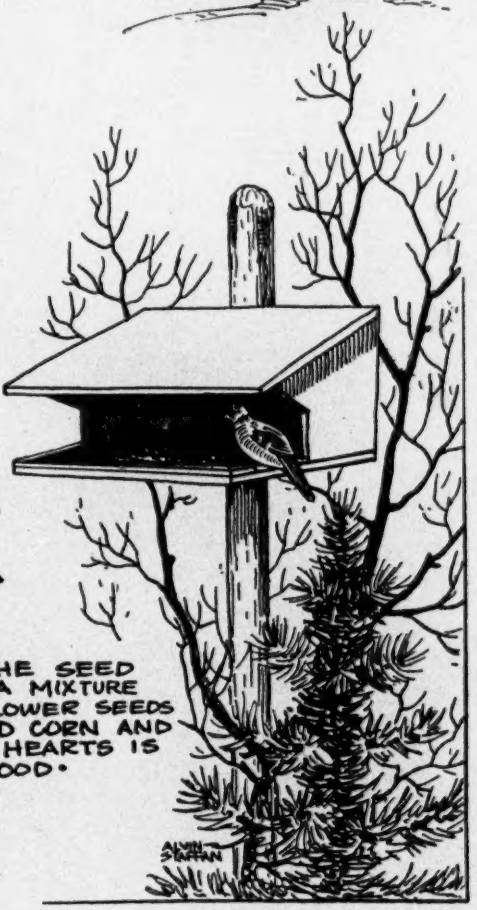
OPERATION TID-BITS

BE SURE TO PLACE FEEDERS CLOSE TO SHRUBS OR TREES SO YOUR BIRD GUESTS CAN FLY INTO THE BRANCHES FOR PROTECTION AND SHELTER.

FILL HOLES IN A SMALL SECTION OF LOG WITH SUET MIXED WITH GRAIN OR SUNFLOWER SEEDS. SMALL SHALLOW CANS FILLED WITH THE SAME AND TACKED ON TREES IS ALSO GOOD.

A PIECE OF SUET ~ AN EAR OF CORN WILL ATTRACT THE BLUE JAY AND WOODPECKERS.

FOR THE SEED EATERS A MIXTURE OF SUNFLOWER SEEDS ~ CRACKED CORN AND PEANUT HEARTS IS VERY GOOD.



B I R D H O U S E

Crafts for Retarded, McNeice & Benson, page 65

Materials:

White pine - 3/4" x 4" x 8"
½" hardboard 5" x 30"
#16 wire nails 1" long
Back saw
Square
Ruler
¼" dowel 3" long
Paint or stain
Varnish
Paint brushes
Cleaner - thinner
Brace
#16 & #4 auger bits
Claw hammer

Procedure:

(1) Cut 2 squares 4" x 4" from 3/4" white pine.

(2) Locate center of 1 block by drawing diagonal lines from one corner to the other. These blocks will be the ends of the bird house.

(3) Drill a 1" hole with a #16 auger bit at the intersection of the lines.

(4) Measure up from 1 corner 1" and drill a hole with the #4 auger bit. This is to hold the perch.

(5) Cut one piece of hardboard 4" x 6" for one side.

(6) Cut another piece of hardboard 4¼" x 6" for second side.

(7) Nail sides to the end pieces with #16 wire nails 1" long. It is sometimes easier to drill holes in hardboard before nailing. Make sure the hole for the perch is at the opposite corner from the peak of the roof.

(8) Cut one side of the roof 5" x 9".

(9) Cut the other side of the roof 5 1/8" x 9".

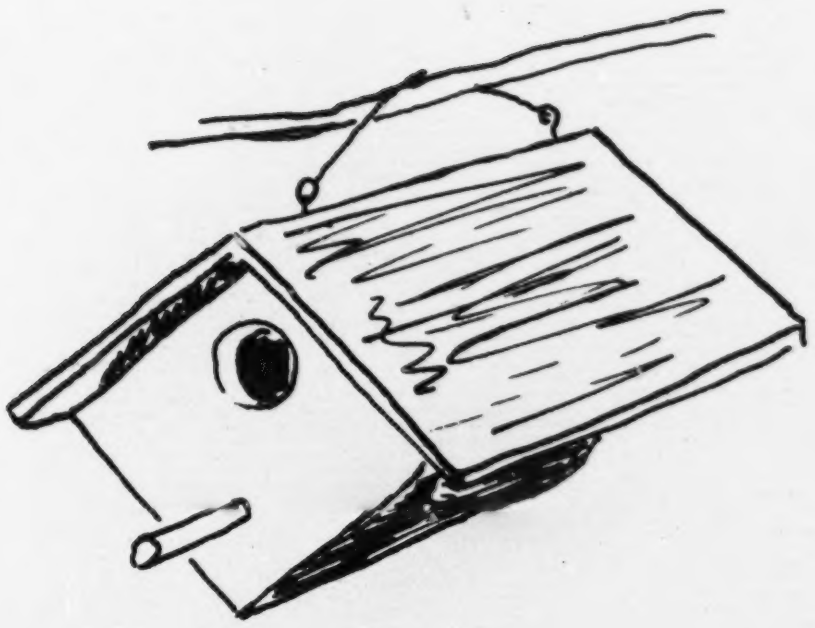
(10) Nail roof in place with wire nails. Roof may overhang the end pieces if desired.

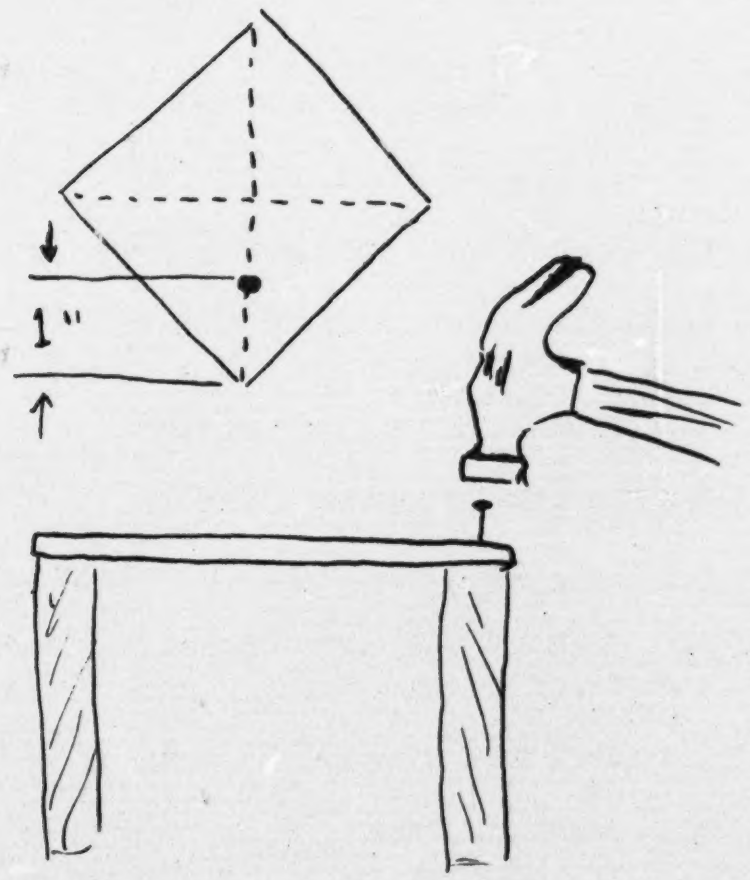
(11) Cut perch from ¼" dowel 3" long.

(12) Glue perch in place.

(13) Insert screw eyes in place by drilling a small hole through roof with small drill and inserting screw-eyes.

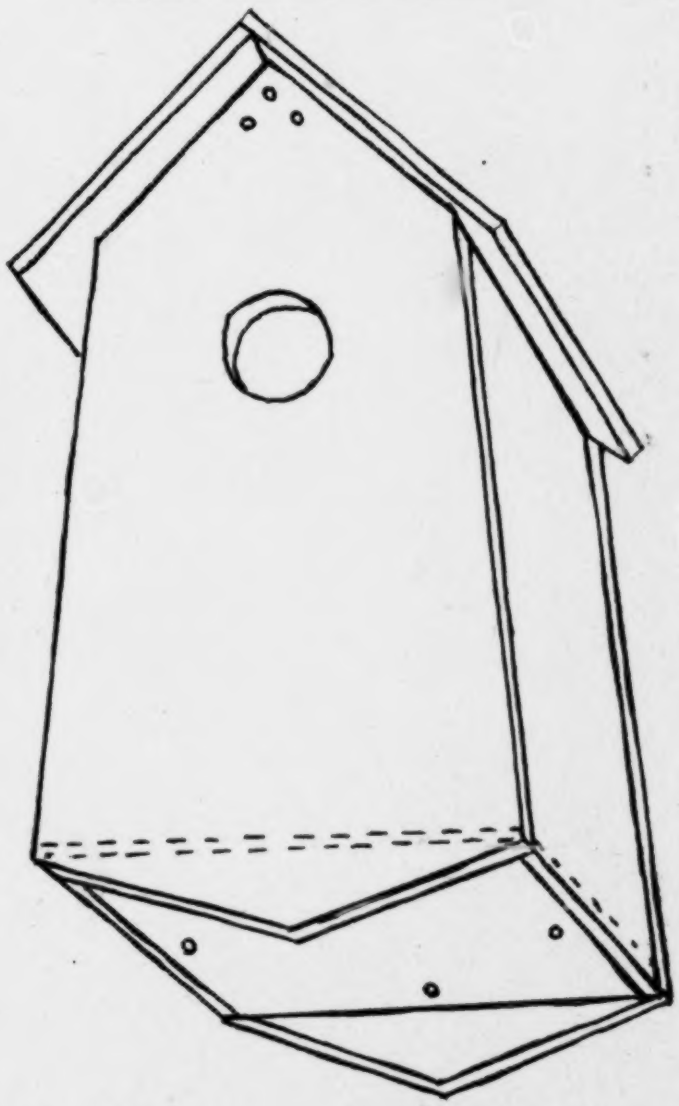
(14) Paint bird house with enamel, exterior paint or stain and varnish.




1"

Cooperative Extension Service IOWA STATE COLLEGE Ames, Iowa
April 1958 Entomology and Wildlife WL-21

A SIMPLE BLUEBIRD HOUSE



MATERIALS

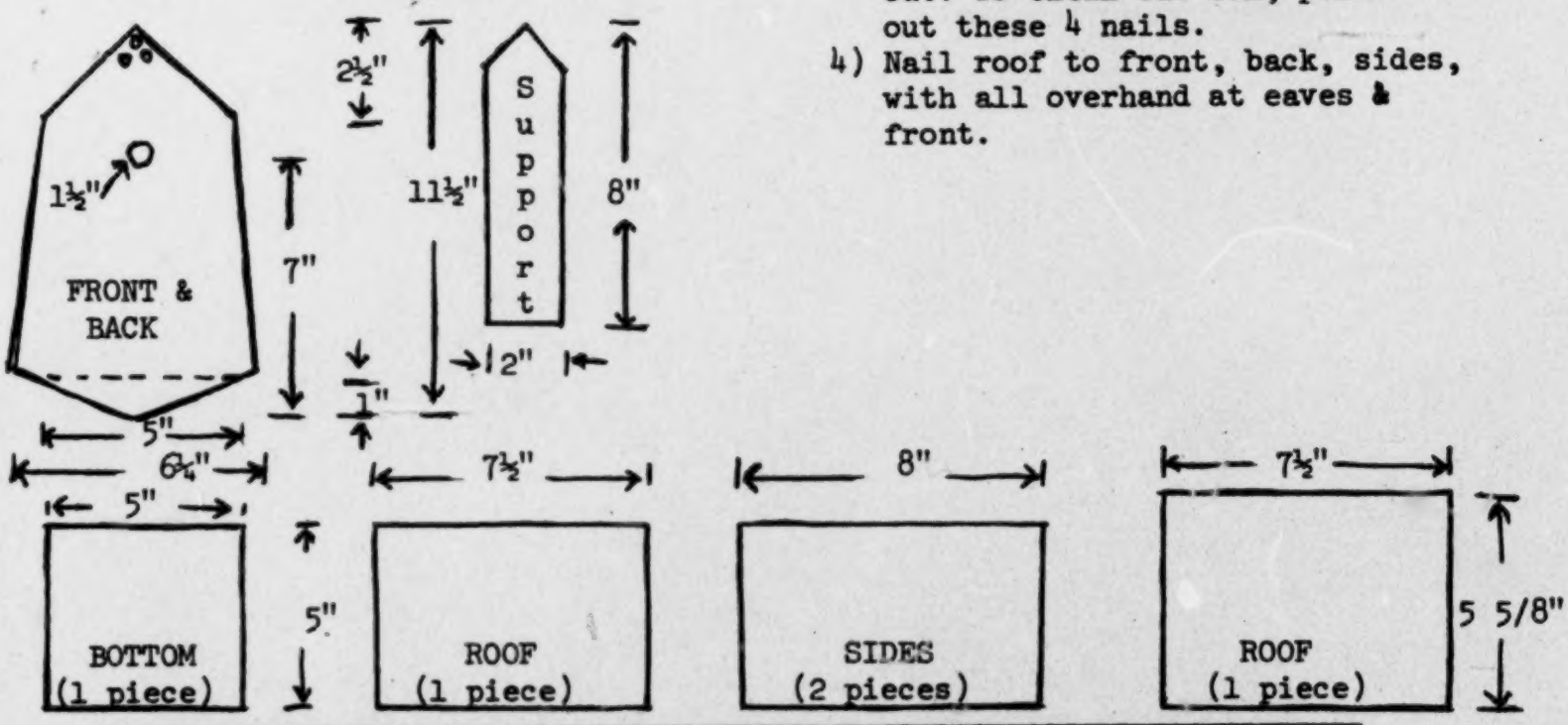
5/8" plywood
5" x 36"
8" x 24"
2" x 8"

TOOLS

Saw, hammer, #4 finish nails, plane, brace, bits of 1½" and ¼".

PROCEDURE

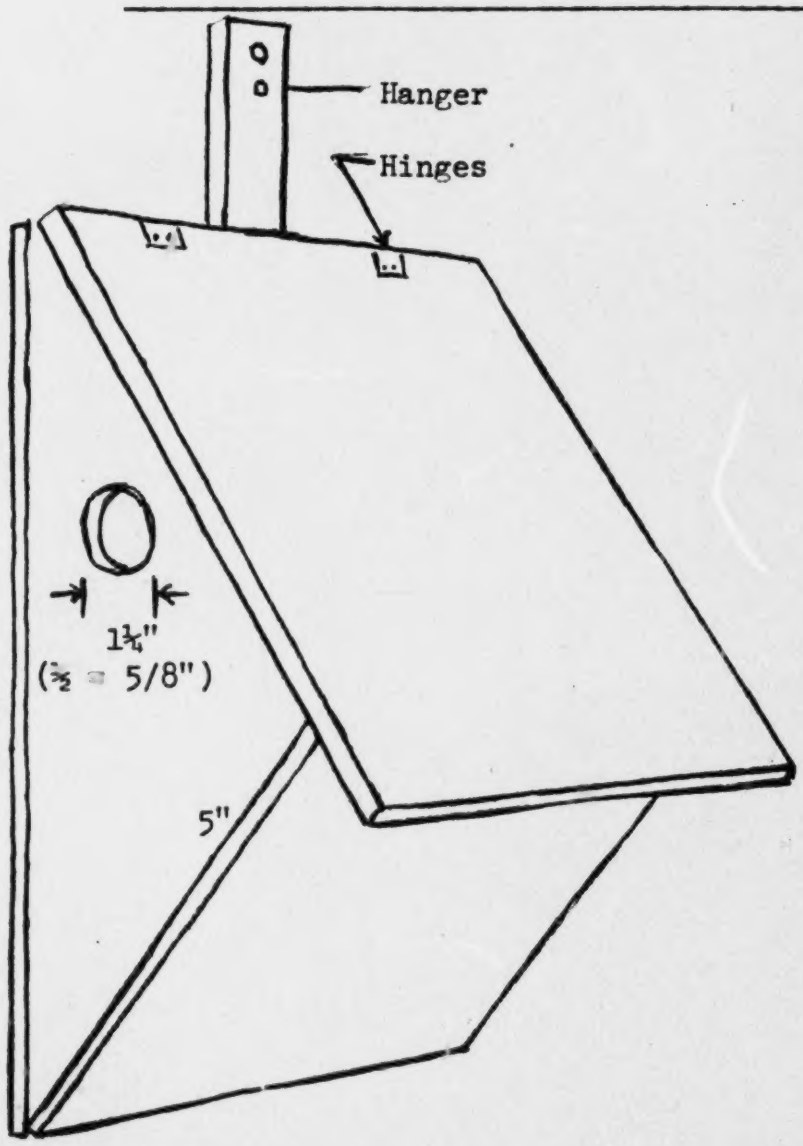
1) Nail support to back so that pointed end sticks 2" above roof.
2) Bore 1½" entrance hole and ¼" drain holes in bottome, and 3 - ¼" ventillation holes - top of house.
3) Nail through back into sides, nail through front into sides.
4) Drive single nails through front, back and sides into bottom. Let nail heads stick out. To clean out box, pull out these 4 nails.
4) Nail roof to front, back, sides, with all overhand at eaves & front.



Prepared by Robert B. Moorman, extension wildlife conservationist Cooperative Extension Work in Agriculture and Home Economics, Iowa State College of Agriculture and Mechanic Arts and the United States Department of Agriculture Cooperating. Extension Service, Floyd Andre, director, Ames, Iowa. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

IOWA STATE UNIVERSITY of Science and Technology
Cooperative Extension Service . . . Ames, Iowa

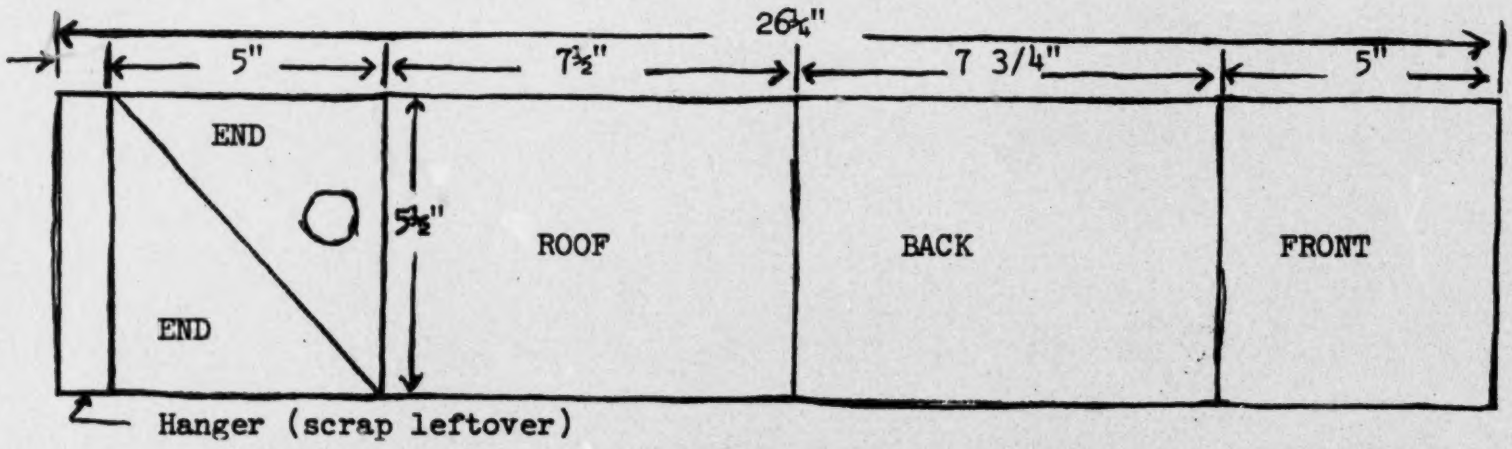
WL-24
April, 1967



CHICKADEE NEST BOX

Notes:

1. Use ½" x 6" board or ½" box scraps.
2. Drill two ventilation holes and two drain holes in back. Sand. Stain. Varnish.
3. Nail hanger onto back before mounting roof.
4. Mount roof with metal or leather straps to permit cleaning.
5. For chickadees tack bark on outside - they prefer it.
6. Hang house on tree, 10 feet or more above ground.



Prepared by Robert Moorman, extension wildlife conservationist
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WL-31
February, 1968

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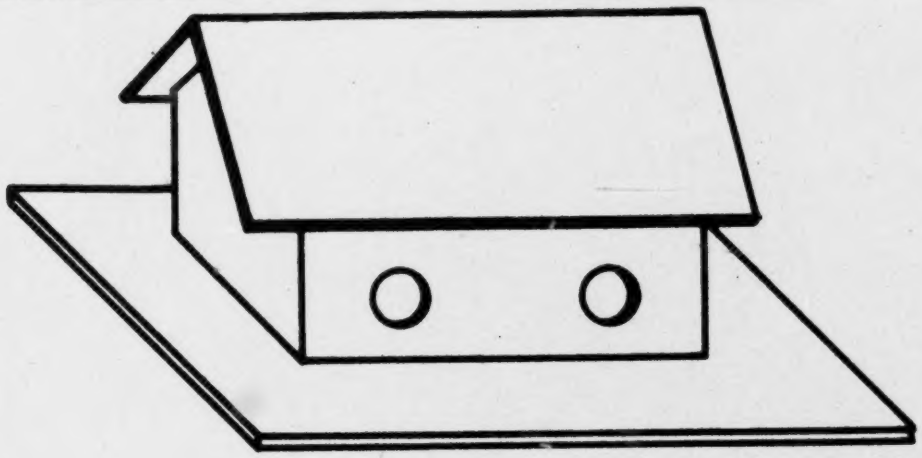
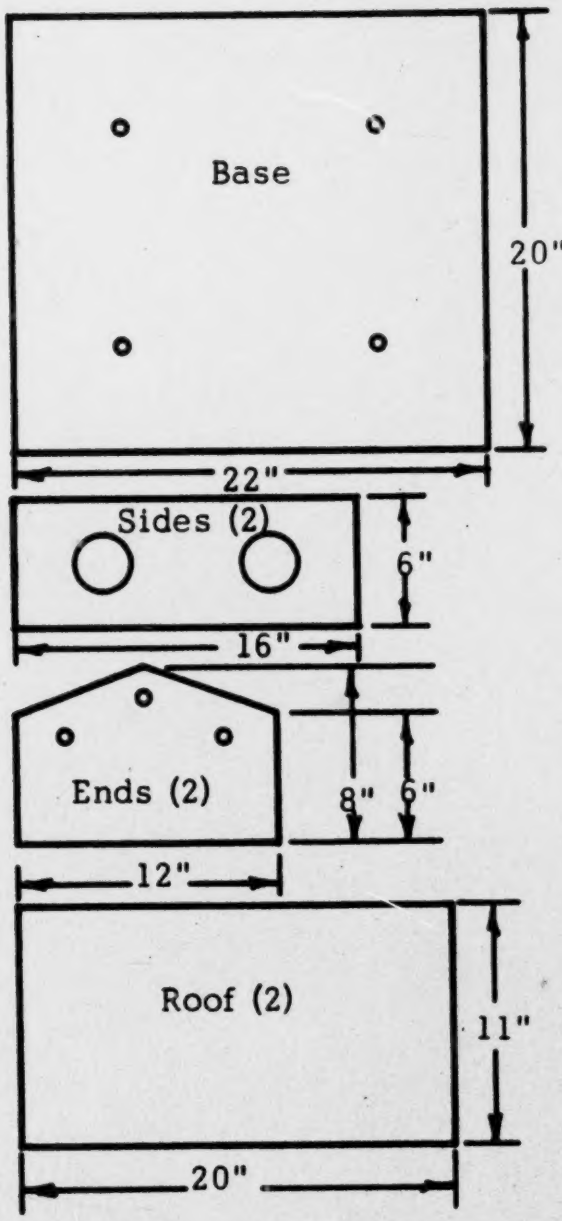
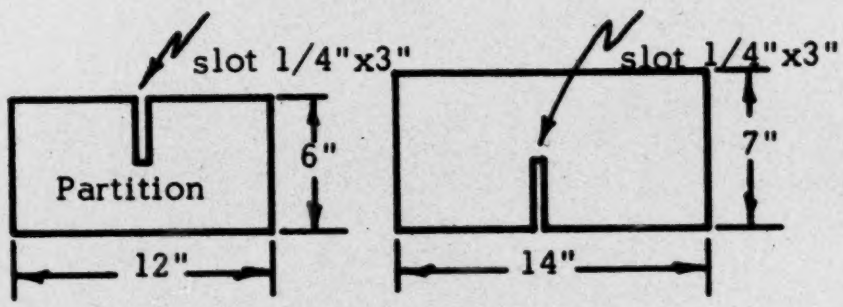


A FOUR ROOM MARTIN HOUSE



1. Base, sides and roof pieces are 1/2" exterior plywood.
2. Ends are 1" board or 3/4" exterior plywood.
3. Interior partitions are 1/4" plywood.
4. Entrance holes are 2 1/2" in diameter, their bottom edge is 1" above the floor.
5. Ventilation holes in ends, drain holes in base.
6. Bevel the upper edge of sides to permit roof to fit tightly.
7. Cap the roof peak with strip of sheet metal.
8. Paint the exterior white, leave interior unpainted.
9. Mount on pole 15 feet or more high, away from trees and buildings.
10. For more than 4 pairs of martins, add another level below this one, with another "base" for a ceiling that extends beyond the walls 2" on all sides.
11. Martins arrive in Iowa about April 8. Put up the house April 1 or, if mounted earlier, keep entrances sealed from sparrows with cardboard or screen until April 1st.



Prepared by Robert B. Moorman, extension wildlife conservationist

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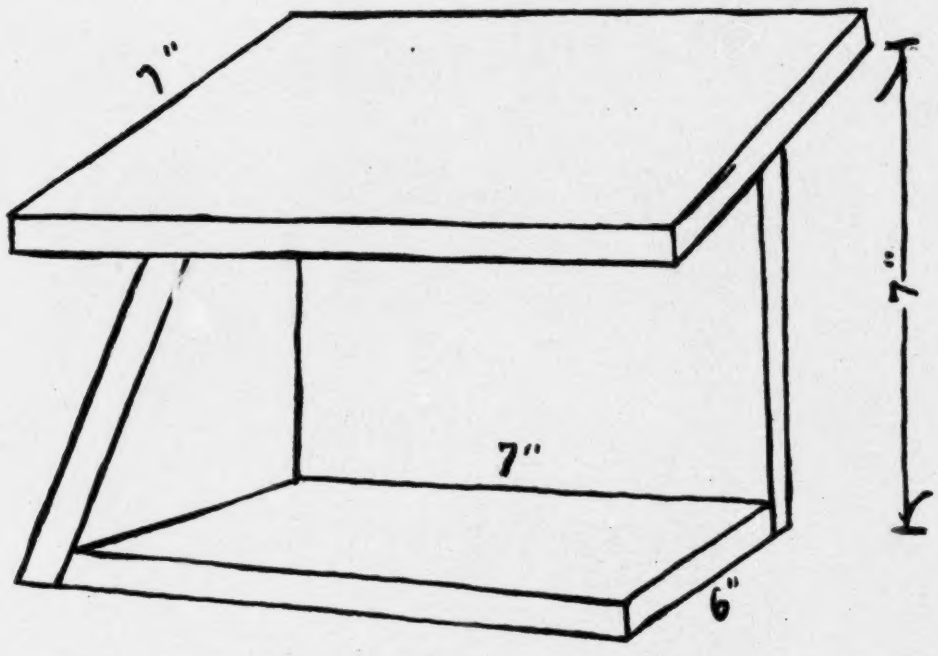
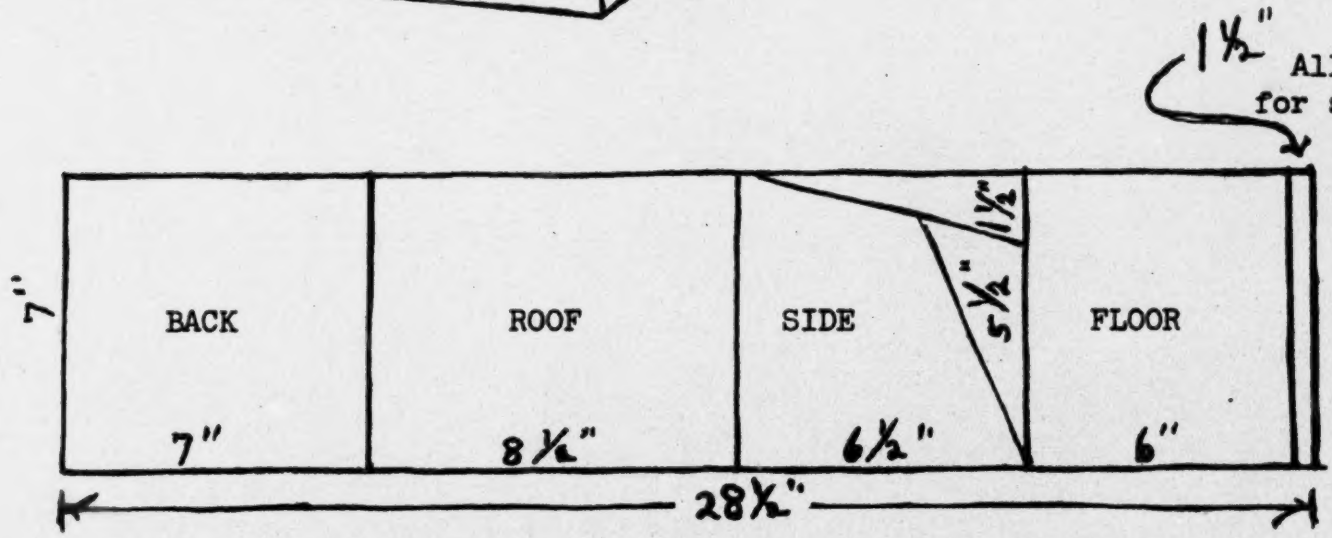
Cooperative Extension Service IOWA STATE COLLEGE Ames, Iowa
April, 1959 Entomology and Wildlife WL-23

A ROBIN NESTING SHELTER





Notes: 1) There is only one side
2) Roof overhangs on sides and front
3) In assembling -
a. Nail through back into floor
b. Nail through side into floor and back
c. Nail through roof into side and back.
4) Design is for ½ inch plywood. For wood of a different thickness calculate length of side as 6 inches + the thickness of wood used.

Cooperative Extension Service in Agriculture and Home Economics. Iowa State College of Agriculture and Mechanic Arts and the United States Department of Agriculture cooperating. Floyd Andre, Director, Ames, Iowa. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

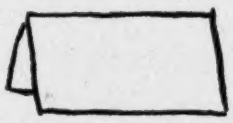
PAPER SAILING SHIP

Materials: Sheet of paper - about 10" x 13"
Wax crayons
Clear spray plastic
Blunt scissors

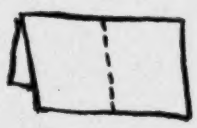
Make a hat, pull on the corners and surprise - a waterproof boat!

1) Color a sheet of paper on both sides with crayons to waterproof. Or, color and spray with clear plastic.

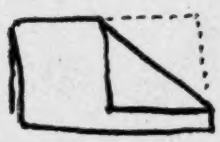
2) Fold it in half the long way.



3) Open the paper and fold it in half the short way.



4) Take one of the two corners along the fold, and fold it into the center crease. Do the same with the other corners.

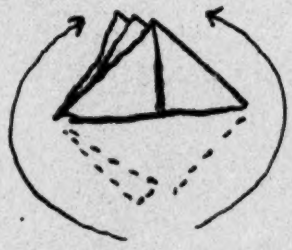


5) Turn up the end flaps.

6) Cut the corners off the flaps, and you have a hat.

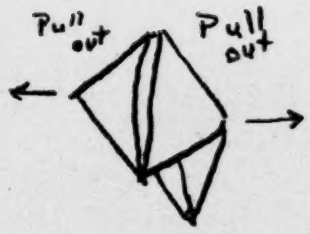
7) Press the end folds of the hat together so that the middle creases become the outside folds.

8) Fold the bottom points up in the peak.

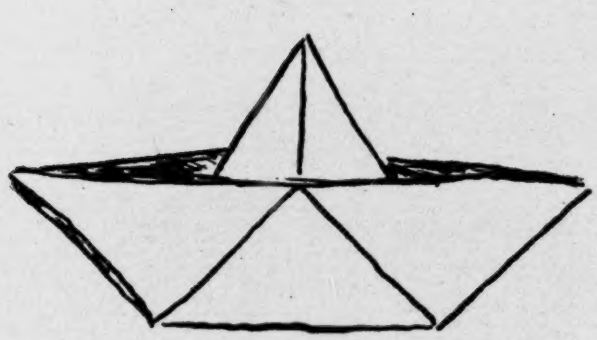


Paper Sailing Ship (con't.)

9) Again press the end folds together so that the middle creases become the outside folds, as in step 7.



10) At the top of your folded square, three points come together to form one corner. Hold the two outside ones and pull them away from the middle point. Press down on the sides to complete your boat.

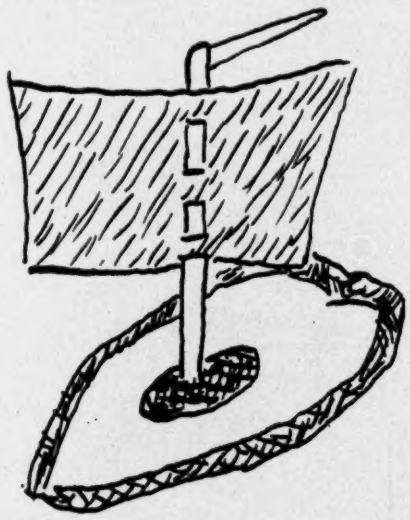


Adapted from Childcraft, The How and Why Library
Volume 9, "Make and Do", page 10.

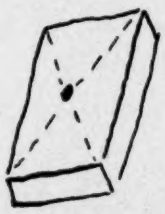
SMALL SAIL BOATS

a. Walnut Shells - Carefully cut a walnut shell in half. Put a small wad of clay inside of it. Draw a sail about the size of a postage stamp and cut it out. Put a toothpick mast in and out through the sail. Stick the bottom end of the mast in the clay.

materials: Unbroken halves of walnut shells, clay, paper, scissors, pencils, toothpicks.



b. Scrap Wood - Most any small piece of scrap wood or lumber can be made into a personal sail boat. Drill a hole in the center (draw lines from corner to corner to find the middle point),



Push the mast in and out through the sail. Put some glue in the hole and put in the dowel or small branch or toothpick with the sail on it. All set for the puddle!

materials: Scrap of wood or lumber - about 2" x 3"
¼" doweling, branch or toothpick about 3" - 5"
1/8" drill and bit
Paper or scrap of cloth - about 3" x 3"
Puddle, stream, pond, etc.

S A I L B O A T S

Crafts for Retarded, McNeice & Benson, p. 84

Materials - soft wood, 3/4" thick
1/4" dowel, 20" long
paint, brush, cleaner, thinner
1 3/4" wire brads
glue
wax paper or construction paper
compass
hammer
sandpaper
ruler
pencil
coping saw
hand brace
1/4" twist drill
1/2 rod cabinet file
C-clamp
scissors

Procedure:

(1) Cut a piece of soft wood approximately 4" X 10". The grain of the wood should be parallel to the length of the board.

(2) Find the center of each end of the board and draw a line down the middle.

(3) From one end, lay out a point on each side 3" from the end. Draw lines from these points to the center of the end.

(4) At the opposite end, lay out small arcs at the corners of the board with the compass.

(5) Clamp the board in a vise or to a table top with a C-clamp and cut boat out with a coping saw.

(6) On the center line made in step 2, lay out a point 3" from the bow and a 2nd point 1 1/2" from the stern. Drill 1/4" holes at these 2 points. Make the holes only 1/2" deep.

(7) Cut 2 pieces of 1/4" dowel each 10" long.

(8) Glue dowels in place.

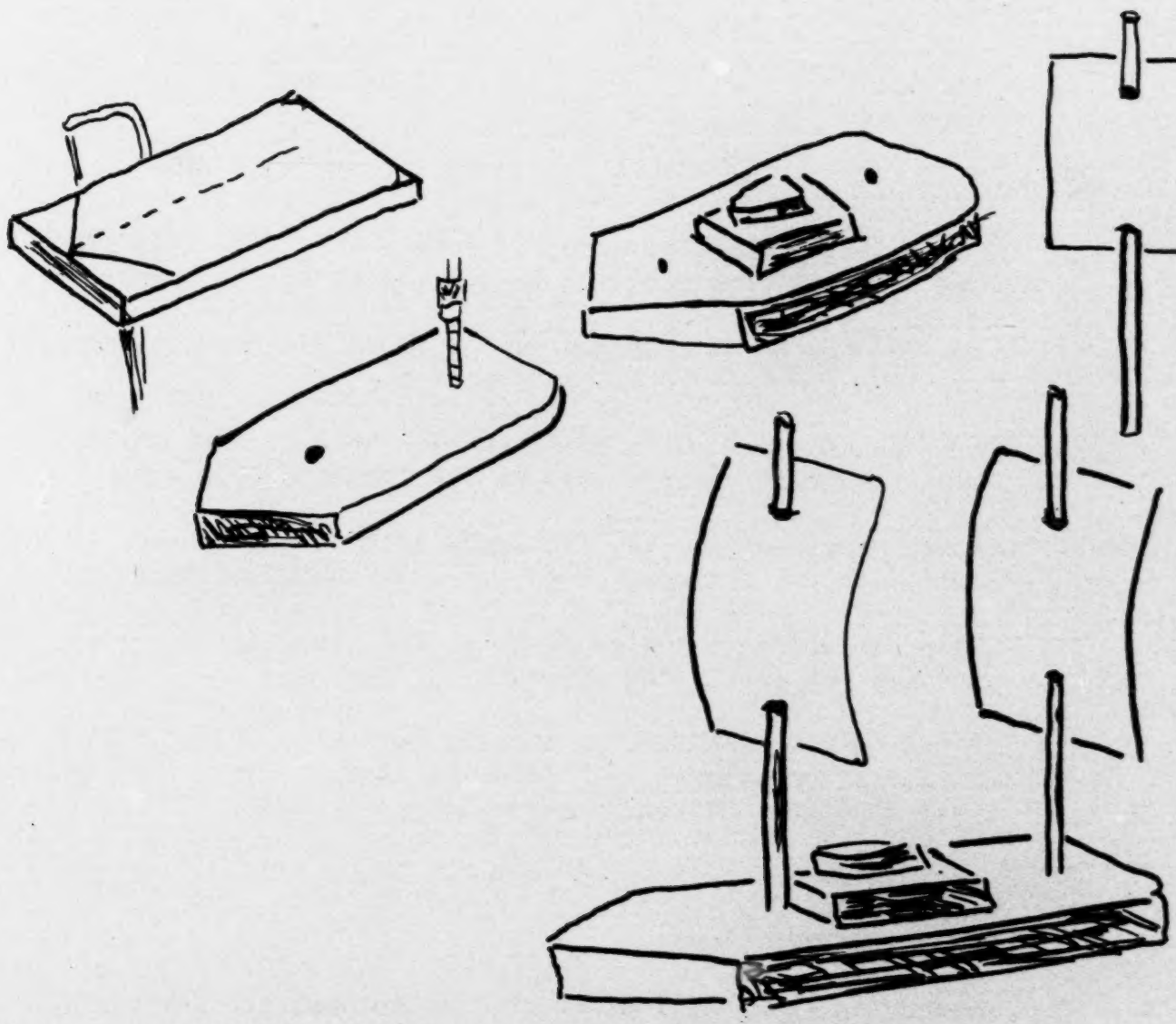
(9) Make cabin from small block of wood and nail in place with 1 1/4" wire brads.

(10) Paint and decorate the boat.

(11) Cut 2 pieces of wax paper or construction paper 4" X 6" for the sails.

(12) Punch holes or cut 2 small slits in the center of each sail, 1" from each end.

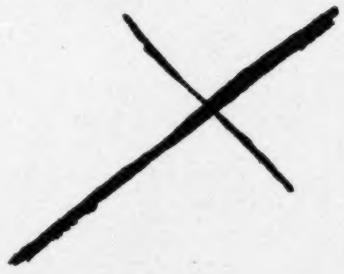
(13) Place sails over each of the masts.



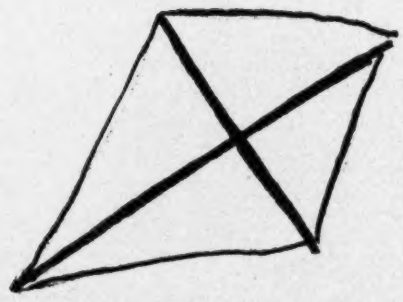
K I T E

Materials:

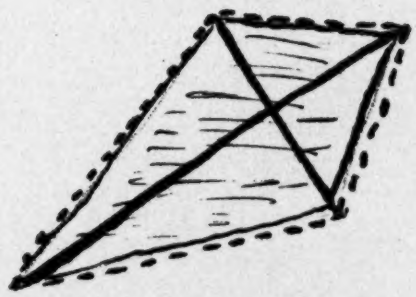
1 long strip of thin light wood.
1 shorter strip of thin light wood.
Large piece of paper (newspaper, paperbag, brown paper).
Thin strips of cotton material.
Long, long string.



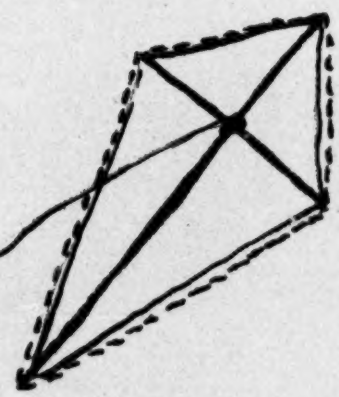
Put the 2 sticks together at right angles.



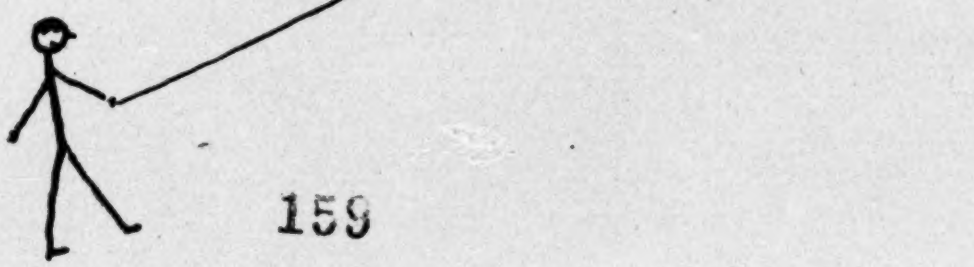
Tie a string around the four edges of the sticks. Cover the frame with the large paper and paste the edges around the string.



Make a tail of the thin strips of cloth and tie to the bottom of the long stick.



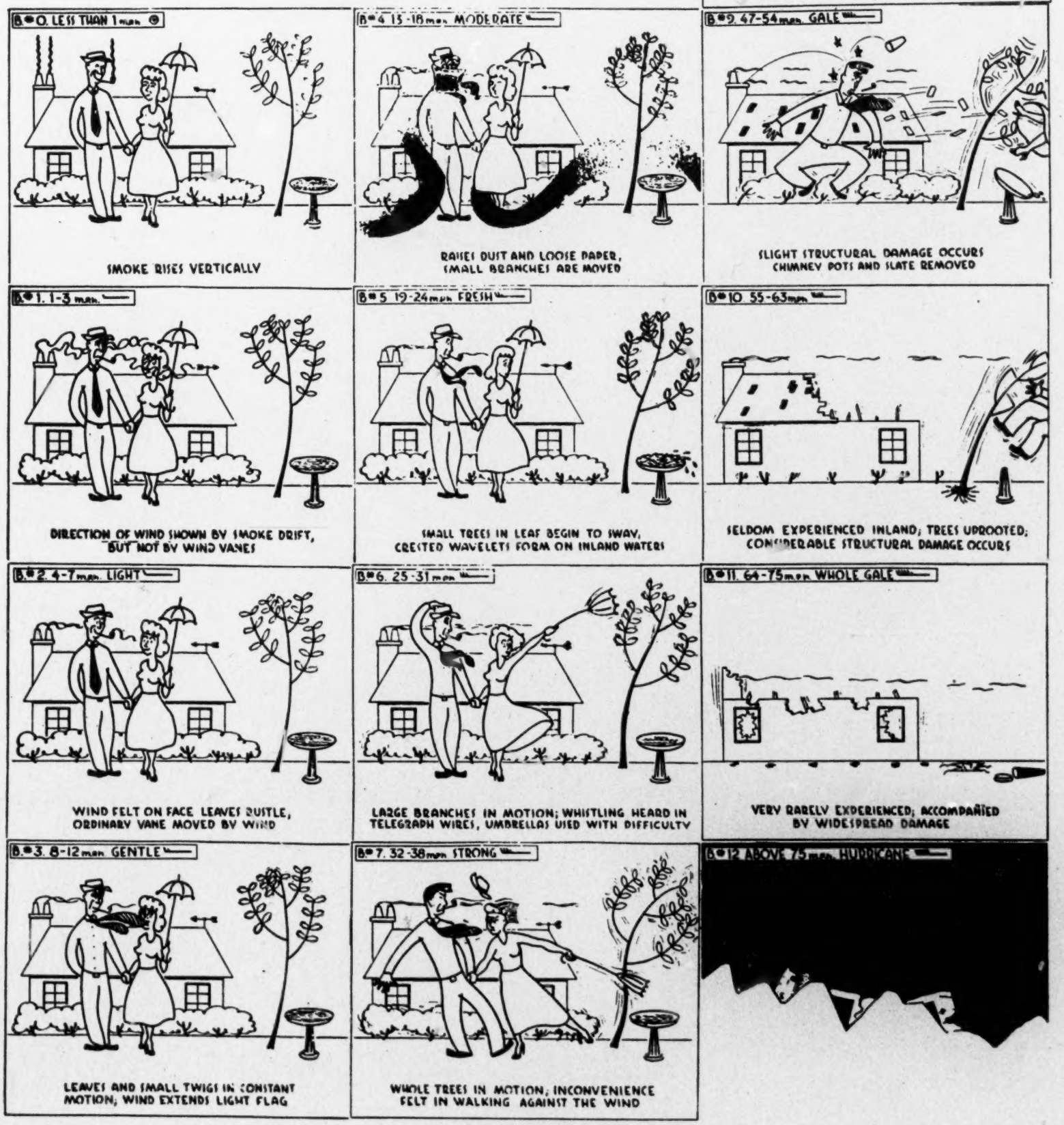
Attach the long, long string to the frame where the strips cross.



HOW TO JUDGE WIND VELOCITY

An Original Beaufort Wind Scale, drawn for the National Audubon Society by Mr. Wade, Los Angeles County Museum.

Read downward — each Beaufort number gives the range of wind velocity and the symbol on weather maps.


B.*0. LESS THAN 1 m.p.h.
SMOKE RISES VERTICALLY
B.*1. 1-3 m.p.h.
DIRECTION OF WIND SHOWN BY SMOKE DRIFT, BUT NOT BY WIND VANES
B.*2. 4-7 m.p.h. LIGHT
WIND FELT ON FACE LEAVES RUSTLE, ORDINARY VANE MOVED BY WIND
B.*3. 8-12 m.p.h. GENTLE
LEAVES AND SMALL TWIGS IN CONSTANT MOTION; WIND EXTENDS LIGHT FLAG
B.*4 13-18 m.p.h. MODERATE
RAISES DUST AND LOOSE PAPER, SMALL BRANCHES ARE MOVED
B.*5 19-24 m.p.h. FRESH
SMALL TREES IN LEAF BEGIN TO SWAY, CRESTED WAVELETS FORM ON INLAND WATERS
B.*6. 25-31 m.p.h.
LARGE BRANCHES IN MOTION; WHISTLING HEARD IN TELEGRAPH WIRES, UMBRELLAS USED WITH DIFFICULTY
B.*7. 32-38 m.p.h. STRONG
WHOLE TREES IN MOTION; INCONVENIENCE FELT IN WALKING AGAINST THE WIND
B.*8. 39-46 m.p.h.
BREAKS TWIGS OFF TREES GENERALLY IMPEDES PROGRESS
B.*9. 47-54 m.p.h. GALE
SLIGHT STRUCTURAL DAMAGE OCCURS CHIMNEY POTS AND SLATE REMOVED
B.*10. 55-63 m.p.h.
SELDOM EXPERIENCED INLAND; TREES UPROOTED; CONSIDERABLE STRUCTURAL DAMAGE OCCURS
B.*11. 64-75 m.p.h. WHOLE GALE
VERY RARELY EXPERIENCED; ACCOMPANIED BY WIDESPREAD DAMAGE
B.*12 ABOVE 75 m.p.h. HURRICANE

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160

5M

WIND CHILL CHART

Actual Thermometer Reading (°F)

Estimated Wind Speed (MPH)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
CALM	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
5	37	33	27	22	16	11	6	1	-5	-11	-15	-20	-26	-31	-36	-41	-47
8	32	26	20	15	9	4	-1	-8	-14	-19	-23	-30	-36	-42	-47	-53	-59
10	28	21	16	8	4	-2	-9	-15	-21	-27	-33	-40	-46	-52	-58	-64	-70
13	25	18	12	4	-2	-7	-13	-20	-28	-33	-38	-45	-53	-59	-64	-71	-78
15	22	16	9	1	-6	-12	-18	-25	-36	-39	-45	-52	-58	-65	-72	-77	-85
18	20	14	6	-1	-7	-15	-21	-29	-38	-43	-49	-56	-64	-70	-76	-84	-91
20	18	12	4	-3	-10	-17	-25	-32	-39	-46	-53	-60	-67	-75	-82	-89	-96
23	17	10	2	-5	-12	-20	-26	-35	-42	-49	-55	-63	-72	-79	-85	-92	-100
25	16	7	0	-7	-15	-22	-29	-37	-44	-52	-59	-66	-74	-81	-88	-96	-104
30	13	5	-2	-10	-18	-25	-33	-40	-48	-56	-63	-71	-79	-86	-94	-101	-109
35	11	3	-4	-12	-20	-27	-35	-42	-49	-59	-67	-74	-82	-90	-98	-105	-113
40	10	1	-6	-14	-21	-29	-37	-45	-53	-61	-69	-77	-85	-92	-100	-108	-116

Wind speeds greater then 40 MPH have little additional effect

LITTLE DANGER

(For properly clothed person)

INCREASING DANGER

GREATER DANGER

(Danger from freezing of exposed flesh)

*To compute wind chill, match thermometer reading with wind speed

RESOURCES SUITABLE FOR LEAD-UP
AND FURTHUR ACTIVITIES

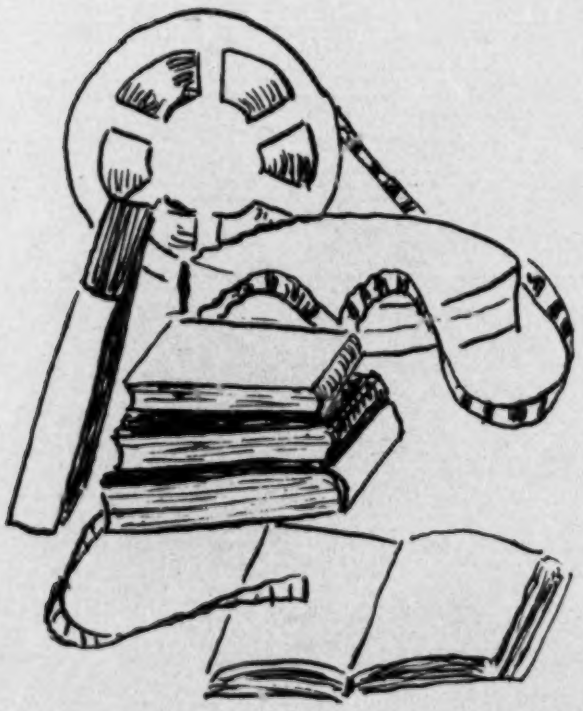
pages 1 - 9

PHONOGRAPH RECORDINGS

pages 10 - 11

B I B L I O G R A P H Y
AUTHOR'S REFERENCES FOR ALL
GUIDES IN UNIT II

pages 12 - 15



RESOURCES SUITABLE FOR
LEAD-UP & FURTHER ACTIVITIES

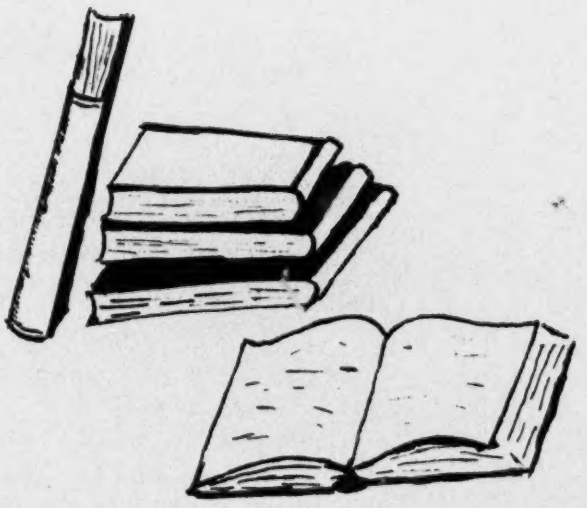
Unit II

Suggested resources for lead-up and further activities may be requested from or through the outdoor education consultant or directly from the listed addresses.

When requesting plans and/or materials from the outdoor education consultant, please explain what it is you plan to be doing and the consultant will gather and send you suitable materials.

This listing will be updated as more materials are acquired and/or reviewed by the H.C.N.S.C. In addition, it is suggested that you consult the I.M.C. book and film catalogs.

When you have found particularly effective resources please share them with others by sending titles, publishers, addresses, etc. to the Handicapped Children's Nature Study Center.



* - indicates that the materials are available at the Handicapped Children's Nature Study Center.

A. BOOKS

Air All Around
Pine, Tillie S. & Levine, Joseph
Whittlesey House
A Division of McGraw - Hill Book Co., Inc.
330 West 42nd Street
New York, New York 10018
1960, 48 pp.

Air Around Us, The True Book of
Friskey, Margaret
Childrens Press
Chicago, Illinois
1953, 47 pp.

All Around You: A First Look at the World
Bendick, Jeanne

Resources (con't.)

Andy All Year Round
Merriam, E. I.M.C. #15115 (p) 525

Animals At My Doorstep
Hover, Helen
Parent's Magazine Press
New York, 1966

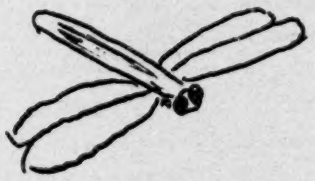
Down the Mountain
Bartlett, Margaret F.
Scott, New York, 1963
I.M.C. #11781 (PI) 551.3

Find Out by Touching
Showers, Paul
Crowell, $2.95

Inspirational Poetry for Camp & Youth Groups
Compiled by: H. Jean Berger
Burgess Publishing Company
Minneapolis 15, Minnesota

Let's Find Out About Air
Shopp, Martha & Charles
Franklin Watts Inc.
575 Lexington Avenue
New York 22, New York
1963, 42 pp.

My Five Senses
Aliki I.M.C. #11882 (p) 612



Nature Notebook
Candy, Robert
Houghton Mifflin Co.
Boston, Mass.
1953, 114 pp., $3.00

Play With Seeds
Selsaman, Millicent E.
William Morrow & Company
New York, 1957, 93 pp.

Question and Answer Book of Nature, The
Saunders, John R.

Soil Conservation Workbook
The Interstate Printers & Publishers, Inc.
Danville, Illinois, 75¢

* Tale of a Meadow, The
Kane, Henry B.
Alfred A. Knopf, Inc.
New York, New York
1959, , $3.00

Resources (con't.)

* Tale of a Pond, The
  Kane, Henry B.
  Alfred A. Knopf, Inc.
  New York, New York
  1960, 120 pp., $3.50

* Tale of a Wood, The
  Kane, Henry B.
  Alfred A. Knopf, Inc.
  New York, New York
  1962, 119 pp., $3.00

Things
  Dunn, Phoebe and Tris

This Is Our Soil
  Walker, Ernest D. & Foster, Albert B.
  The Interstate Printers & Publishers, Inc.
  Danville, Illinois, 60¢

* Trip to the Pond: An Adventure in Nature, A
  Hofmann, Melita
  Doubleday, Garden City, New Jersey
  1966

Water All Around
  Pine, Tillie S.
  McGraw - Hill
  New York, 1959

What is Soil?
  Syrocki, B. John
  Benefic Press
  Chicago, 1961

Young Scientist Takes A Walk
Guide to Outdoor Observations
  Barr, George
  McGraw-Hill Book Co., Inc.
  330 W. 42nd Street
  New York 36, New York
  1959, 160 pp., $3.00

Audubon Nature Encyclopedia

Encyclopedia Britannica
  Encyclopedias with plant, animal, water, soil, etc. color photograph plates

Golden Book Nature Series for Children

Life Nature Library Series

B. CHARTS, POSTERS, FLASHCARDS

* American Forest Institute 1835 K Street, N.W. Washington, D. C. 20006	"Growth of A Tree" and other titles
* Forest Service U.S. Department of Agriculture Washington, D. C. or, local region	"Forests & Trees of the U.S." "How A Tree Grows" and several other titles
* Gull Lake Environmental Education Project Kellog Bird Santuary RT. 1, Box 339 Augusta, Michigan 49012	H.C.N.S.C. has charts on pond life, birds and mammals; also slide and tape sets on pond life and mammals.
* John A. Gustafson, Treasurer American Nature Study Society R.F.D. #1 Homer, New York 13077	Packet of Nature Study Projects and Nature Photographs.
* National Audubon Society 1130 Fifth Avenue New York, New York 10028	H.C.N.S.C. has all charts offered - laminated for full use - plants, birds, trees, ecology, wildflowers - hawk amphibians, mammals.
* Nature Study Aids NASCO Fort Atkinson, Wisconsin	
* Society for Visual Education, Inc. 1345 Diversey Parkway Chicago, Illinois	H.C.N.S.C. has "Picture Story Study Print Sets" - with 33 1/3 rpm 12" record - Spring Wild Flowers, Familiar Cloud Forms, Familiar Birds, Wild Animals, Common Birds, Common Insects.
* Soil Conservation Service Department of Agriculture Washington, D.C. or local district	charts, posters
Teach Me About Series McGraw-Hill Book Co. 330 West 42nd Street New York, New York 10036	flashcards, charts

C. FILMS, FILM-STRIPS, SLIDES

Churchill Films 6671 Sunset Blvd. Los Angeles, California 90025	"Tree, The" "Rainshower" Color, senses, no text check for other titles
Coronet Films 65 East South Water Street Chicago, Illinois 60601	"We Explore the Field and Meadow" "The Muddy Raindrops" "Birds of the Countryside" "Animals & Their Food" "Birds of Our Storybooks" and numerous other films and film-strip titles
Dimension Films 662 North Robertson Los Angeles, California	"Rainshower" With teacher Guide
Encyclopedia Brittanica Films, Inc. 1150 Wilmette Avenue Wilmette, Illinois 60091	"Wind & What It Does" "Insects In a Garden" "Looking at Birds" and numerous other titles
U.S. Forest Service U.S. Department of Agriculture Washington, D.C. 20250 or Your region (Illinois, Indiana, Iowa Minnesota, Missouri, Ohio, Wisconsin) 633 W. Wisconsin Avenue Milwaukee, Wisconsin 52303	"Patterns of the Wild" and many other titles "National Grasslands, The"
* Gull Lake Environmental Education Project Kellog Bird Sanctuary Rt. 1, Box 339 Augusta, Michigan 49012	Slide and Tape sets on Pond Life and Mammals
Hank Newenhouse, a Div. of NOVD 1825 Willow Road Northfield, Illinois 60093	"Rickey's Great Adventure" Film No. 777, Atlantis Production, Primary, 11 minutes, color $125.00 - Rental $12.50
I.M.C. 330 East 4th Street Davenport, Iowa 52801 or - your local Instructional Materials Center	"Pigs" #03999 (PI), Color "You and Your Five Senses" #03064 (PI) "Learning With Your Senses" #03409 (P) and many other titles

U.S. Department of the Interior Office of the Secretary Washington, D. C. 20240	Conservation Films listing
International Film Bureau 332 S. Michigan Ave. Chicago, Illinois 60604	"Attracting Birds In Winter" and other titles
Iowa State Conservation Commission Des Moines, Iowa or your local district	Check the film and slide catalogs for various titles
Kalamazoo Nature Center 7000 North Westnedge Kalamazoo, Michigan 49001	"How We Look at Things" $10.00 rental 27 minutes Color, sound, 16mm
McGraw-Hill Text Films 330 West 42nd Street New York, New York 10018	"Air All Around Us" and other titles
Sigma Educational Films Hank Newenhouse, A Div. of NOVD 1825 Willow Road Northfield, Illinois 60093	"Senses, The" Film No. 504, Primary, Color 10 minutes, $125.00 Rental - $12.50
Society for Visual Education, Inc. 1345 Diversey Parkway Chicago, Illinois 60614	Write for catalog of film- strips
United World Films 221 Park Avenue S. New York, New York 10003	"The Soil & Life" Color, 14 minutes

D. MAGAZINES

* American Forests
The American Forestry Association
919 Seventeenth Street, N.W.
Washington, D. C. 20006

Audubon
National Audubon Society
1130 Fifth Avenue
New York, New York 10028

Conservationist, The
State of New York Conservation Department
Albany, New York 12201

National Geographic
National Geographic Society
Washington, D. C. 20036

National Wildlife
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D. C. 20036

Nature & Science
Published for the American Museum of Natural History
By the Natural History Press
A Division of Doubleday & Co., Inc.
Central Park West at 79th Street
New York, New York 10024

Outdoor World
Preston Publishing Company
Circulation Offices
4631 North Lee Highway
Cleveland, Tennessee 37311

* Ranger Rick's Nature Magazine
National Wildlife Federation
1412 Sixteenth Street, N.W.
Washington, D. C. 20036

E. PAMPHLETS, BOOKLETS

Boy Scouts of America New Brunswick, New Jersey 08903	Merit Badge Pamphlets - 35¢ "Geology", "Bird Study", "Forestry", "Gardening", "Insect Life", "Nature", "Reptile Study", "Soil and Water Conservation", "Weather", "Wildlife Management".
* Cornell Science Leaflets New York State College of Agriculture Cornell University Ithaca, New York	"Decay" - 25¢ "Reptiles" - 25¢ "Weather" - 25¢ "Snow and Ice" - 25¢ "Water Wonder" - 25¢ "Animal Tracks" - 25¢ "Fungi" - 25¢ "Ferns" - 25¢ "Amphibians" - 25¢ "Nature Poetry" - 25¢ and other similar titles
* Forest Service U.S. Department of Agriculture Washington, D. C.	Ranger 'Rithmetic for: 1st & 2nd, 3rd, 5th, and 7th grades "Why Leaves Change Color" and numerouse other titles

* National Audubon Society 1130 Fifth Avenue New York, New York 10028	Ecology, Birds, Trees, Plants, Mammals - study booklets - students and guides for teachers; Bird leaflets
* National Wildlife Federation 1412 Sixteenth Street, N.W. Washington, D. C. 20036	Wildlife pamphlets - 10¢ each "Soil Means Life" "Wildlife of Forest and Rangelands" William L. Reavley "Wildlife of Farm and Field" John D. Bulger "Wildlife of Lakes, Streams and Marshes" H. R. Morgan
* Soil Conservation Service U.S. Department of Agriculture Washington, D. C. or Supt. of Documents U.S. Printing Office Washington, D. C. 20402	Check local and/or national for titles
* State Conservation Commission Des Moines, Iowa	"A Peek At Iowa Wildlife" "Iowa Wildlife Tracks"
* Zucker, Isabell National Garden Bureau 708 West Log Lake Road Bloomingfield Hills Michigan 48013	"Four Seasons of Fun For Youngsters"

F. PHONOGRAPH AND TAPE RECORDINGS

"Weather Songs" MR 0322 Motivation Records	Word sheets included
* "Bird Songs In Your Garden" Houghton Mifflin Company 52 photographs and 10" 33 1/3 rpm record	
* Society For Visual Education Inc. 134 Diversey Parkway Chicago, Illinois 60614	Wildlife record & pictures
Popular recordings - "Autum Leaves" "Swanee"	

Resources (con't.)

G. MISCELLANEOUS (Packets, folders)

*	The Garden Club of America Conservation Committee 598 Madison Avenue New York, New York 10022	"The World Around You - Our Natural Resources Educational Packet"
*	Handicapped Children's Nature Study Center Muscatine-Scott County School System 1523 South Fairmount Street Davenport, Iowa 52802	"Observing Our Environment Through Our Senses"
*	Nature Study Aid Specimans NASCO Fort Atkinson, Wisconsin	Iowa Leaves, raccoon paws (front & rear)
*	Bureau of Land Management U.S. Department of the Interior Washington, D. C.	"Meet Johnny Horizon" - Kit, for keeping our land clean
*	Keep America Beautiful 99 Park Avenue New York, New York 10016	leaflets, listings of materials available.

Handicapped Children's
Nature Study Center

September 1970

PHONOGRAPH RECORDINGS

The following phonograph recordings are available from the HCNSC for one month loan periods.

Animal Songs
Lenti, Anna
Columbia, with song book
33 1/3 rpm, 1 record, 12 inch

Birds, Beasts, Bugs & Bigger Fishes
Seeger, Pete
Folkways Records F P 7011
33 1/3 rpm, 10 inch
Illustrated notes in pocket

Bird Songs in Literature
Narrated by Frederick G. Marcham
of Cornell
33 1/3 rpm, 12 inch record

Bird Songs In Your Garden
Allen and Kellogg
33 1/3 rpm, 10 inch record
Color photos, with guide
25 bird species

Birds World of Song, The
Ansley, Hudson & Sandra
Folkways Record F X 6115
33 1/3 rpm, 12 inch
Descriptive notes in pocket

Common Bird Songs
Borror, Donald J.
33 1/3 rpm, 12 inch
Illustrated 27 page booklet

Dawn In A Duckblind
Allen and Kellogg
33 1/3 rpm, 10 inch
Color photo text - guide

Phonograph Recordings (con't.)

Evening In Sapsucker Woods, An
Laboratory of Ornithology
Cornell University
33 Sapsucker Woods Road
Ithaca, New York 14850
33 1/3 rpm, 10 inch

Field Guide to Bird Songs, A
Allen, Kellogg & Peterson
Eastern & Central North America
Goes with Roger Tory Peterson's
A Field Guide to the Birds

Music & Bird Songs
Laboratory of Ornithology
Cornell University
33 Sapsucker Woods Road
Ithaca, New York 14850
33 1/3 rpm, 10 inch

National Network of American Bird Songs
Stillwell, Jerry & Norma
Vol. 1 - Bird Songs of Dooryard, Field, & Forest
Vol. 2 - Bird Songs of Dooryard, Field, & Forest
Vol. 3 - Western Bird Songs of Dooryard, Field, & Forest
33 1/3 rpm, 12 inch records
Ficker Records
Old Greenwich, Conn.

Songbirds of America In Color, Sound & Story
Allen and Kellogg
33 1/3 rpm, 10 inch
Text - photo, color, guide
24 species

Sounds of Nature
33 1/3 rpm, 12 inch record
Federation of Ontario Naturalists &
Cornell Laboratory of Ornithology

Sounds of Spring
Gunn, William W. H.
33 1/3 rpm, 12 inch record
Federation of Ontario Naturalists

Wild Animals
Talking Picture-Story Study Prints
Society for Visual Education, Inc.
Chicago, Illinois 60614
33 1/3 rpm, 12 inch record

B I B L I O G R A P H Y

AUTHOR'S REFERENCES FOR ALL GUIDES IN UNIT II

Adventures With Your Children - Through Nature

Kunau, Emelda & Moorman, Robert,
Iowa State University of Science & Technology
Cooperative Extension Service
Ames, Iowa
January, 1969, Pm - 446 & Pm - 447, 11 pages each

Conservation Experiences for Children

Bulletin 1957, No. 16
Effie G. Bathurst, Wilhemina Hill,
U.S. Department of Health, Education & Welfare,
Washington, D. C.
75¢

Conservation Tools for Educators, Putting Conservation to Work

U. S. Department of Agriculture
Forest Service
Pacific Northwest Region
1968, 76 pages

Creative Nature Crafts

Robert O. Bale
Burgess Publishing Co.
426 South 6th Street
Minneapolis, Minnesota 55415
1959, 120 pages

Exploring Nature and Exploring the Local Community

Teachers' Guide / Trial Edition
African Primary Science Program
Education Development Center
Newton, Mass.
July 1969, 25 pages and 16 pages

Field Study Manual for Outdoor Learning

Margaret Milliken, Austin F. Hamer, Ernest C. McDonald
Burgess Publishing Co.
426 South 6th Street
Minneapolis, Minnesota 55415
1968, 122 pages

Leader's Guide to Nature-Oriented Activities, A

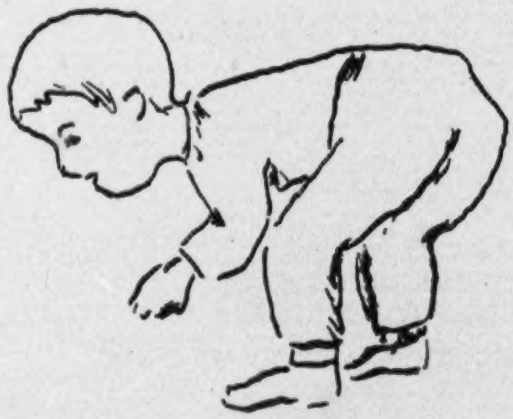
Betty van der Smissen & Oswald H. Goering
The Iowa State University Press
Ames, Iowa
1965, 219 pages

Methods in Conservation and Outdoor Education, Observing Our Environment

Oregon State System of Higher Education
Ernest C. McDonald, Television Instructor
Off-Campus Instruction Programs
Portland Center for Continuing Education
Post Office Box 1491
Portland, Oregon 97207
1969, 42 pages

Nature Recreation, Group Guidance for the Out-of-Doors

William ("Cap'n Bill") Gould Vinal
Dover Publications, Inc.
180 Varick Street
New York, New York 10014
1940 & 1963, 310 pages



Outdoor Education

Charles L. Mand
Charles E. Merrill Publishing Co.
1300 Alum Creek Drive
Columbus, Ohio 43216
1967, 180 pages, $2.95

Outdoor Education

Julian W. Smith
American Association for Health, Physical Education & Recreation
National Education Association
Washington, D. C.
1964, 32 pages

Outdoor Education

Julian W. Smith, Reynold E. Carlson, George W. Donaldson & Hugh B. Masters
Prentice-Hall, Inc.
Englewood Cliffs, New Jersey
1963, 322 pages

Outdoor Education in Oregon Schools

State Department of Education
Salem, Oregon
1968, 118 pages

People & Their Environment, Teachers' Curriculum Guide to Conservation Education, Guides 1 - 8

Edited by Matthew J. Brennan
J. G. Ferguson Publishing Co.
Chicago, Illinois 60602
1968, 1968, 1,133 pages total

a) Grades 1-2-3
b) Grades 4-5-6
c) Science 7-8-9
d) Social Studies 7-8-9
e) Social Studies 10-11-12
f) Biology
g) Home Economics 9-12
h) Outdoor Laboratory 1-12

Putting Conservation to Work, Elementary School Activities

Department of Agriculture
U.S. Forest Service
Portland, Oregon
1964

Putting Conservation to Work, Tools to Help Teachers Put Conservation to Work in the Existing Curriculum

U. S. Department of Agriculture
Forest Service, Pacific Northwest Region
Portland, Oregon
1964, 32 pages

Teacher's Handbook for Study Outside the Classroom, A

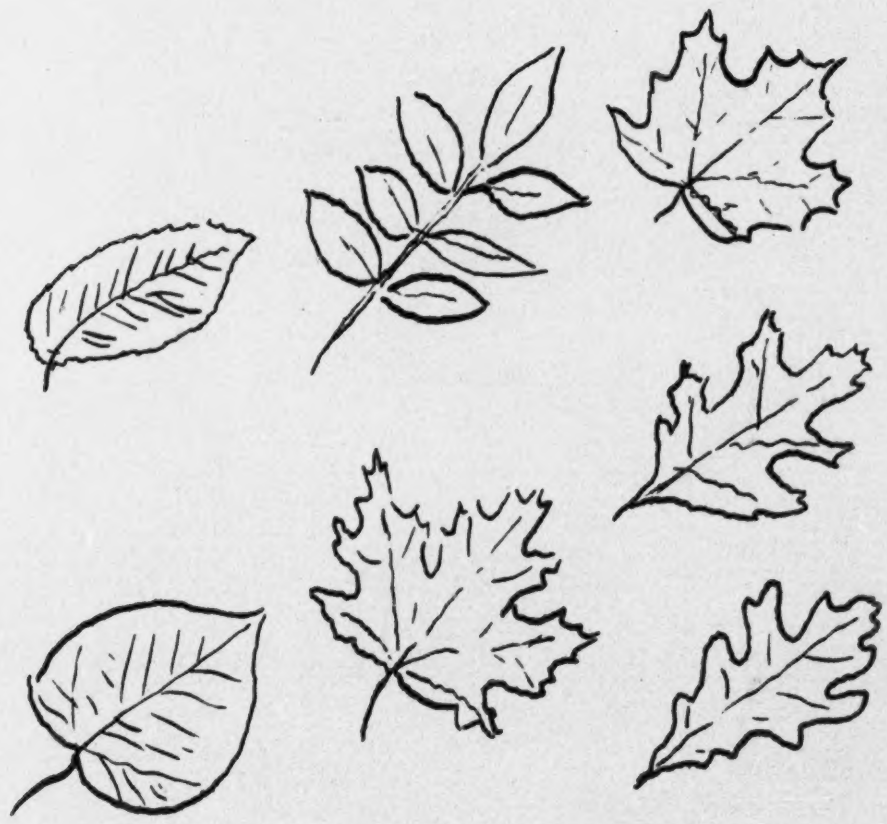
Shirley A. Brehm
Charles E. Merrill Publishing Co.
Columbus, Ohio
1969, 100 pages

Teaching in the Outdoors

Donald R. Hammerman & William M. Hammerman
Burgess Publishing Co.
426 South 6th Street
Minneapolis, Minnesota 55415

Techniques for Teaching Conservation Education

Robert E. Brown & G. W. Mouser
Burgess Publishing Co.
426 South 6th Street
Minneapolis, Minnesota 55415
1964, 112 pages



RESOURCES SUITABLE FOR LEAD-UP
AND FURTHUR ACTIVITIES

pages 1 - 9

PHONOGRAPH RECORDINGS

pages 10 - 11

B I B L I O G R A P H Y
AUTHOR'S REFERENCES FOR ALL
GUIDES IN UNIT II

pages 12 - 15

RESOURCES SUITABLE FOR
LEAD-UP & FURTHER ACTIVITIES

Unit II

Suggested resources for lead-up and further activities may be requested from or through the outdoor education consultant or directly from the listed addresses.

When requesting plans and/or materials from the outdoor education consultant, please explain what it is you plan to be doing and the consultant will gather and send you suitable materials.

This listing will be updated as more materials are acquired and/or reviewed by the H.C.N.S.C. In addition, it is suggested that you consult the I.M.C. book and film catalogs.

When you have found particularly effective resources please share them with others by sending titles, publishers, addresses, etc. to the Handicapped Children's Nature Study Center.

* - indicates that the materials are available at the Handicapped Children's Nature Study Center.

A. BOOKS

Air All Around
Pine, Tillie S. & Levine, Joseph
Whittlesey House
A Division of McGraw - Hill Book Co., Inc.
330 West 42nd Street
New York, New York 10018
1960, 48 pp.

Air Around Us, The True Book of
Friskey, Margaret
Childrens Press
Chicago, Illinois
1953, 47 pp.

All Around You: A First Look at the World
Bendick, Jeanne

Resources (con't.)

Andy All Year Round
Merriam, E. I.M.C. #15115 (p) 525

Animals At My Doorstep
Hover, Helen
Parent's Magazine Press
New York, 1966

Down the Mountain
Bartlett, Margaret F.
Scott, New York, 1963
I.M.C. #11781 (PI) 551.3

Find Out by Touching
Showers, Paul
Crowell, $2.95

Inspirational Poetry for Camp & Youth Groups
Compiled by: H. Jean Berger
Burgess Publishing Company
Minneapolis 15, Minnesota

Let's Find Out About Air
Shopp, Martha & Charles
Franklin Watts Inc.
575 Lexington Avenue
New York 22, New York
1963, 42 pp.

My Five Senses
Aliki I.M.C. #11882 (p) 612

Nature Notebook
Candy, Robert
Houghton Mifflin Co.
Boston, Mass.
1953, 114 pp., $3.00

Play With Seeds
Selsaman, Millicent E.
William Morrow & Company
New York, 1957, 93 pp.

Question and Answer Book of Nature, The
Saunders, John R.

Soil Conservation Workbook
The Interstate Printers & Publishers, Inc.
Danville, Illinois, 75¢

* Tale of a Meadow, The
Kane, Henry B.
Alfred A. Knopf, Inc.
New York, New York
1959, 115 pp., $3.00

Resources (con't.)

* Tale of a Pond, The
Kane, Henry B.
Alfred A. Knopf, Inc.
New York, New York
1960, 120 pp., $3.50

* Tale of a Wood, The
Kane, Henry B.
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Danville, Illinois, 60¢

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McGraw - Hill
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What is Soil?
Syrocki, B. John
Benefic Press
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Barr, George
McGraw-Hill Book Co., Inc.
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* Forest Service U.S. Department of Agriculture Washington, D. C. or, local region	"Forests & Trees of the U.S." "How A Tree Grows" and several other titles
* Gull Lake Environmental Education Project Kellog Bird Santuary RT. 1, Box 339 Augusta, Michigan 49012	H.C.N.S.C. has charts on pond life, birds and mammals; also slide and tape sets on pond life and mammals.
* John A. Gustafson, Treasurer American Nature Study Society R.F.D. #1 Homer, New York 13077	Packet of Nature Study Projects and Nature Photographs.
* National Audubon Society 1130 Fifth Avenue New York, New York 10028	H.C.N.S.C. has all charts offered - laminated for full use - plants, birds, trees, ecology, wildflowers - hawk amphibians, mammals.
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* Soil Conservation Service Department of Agriculture Washington, D.C. or local district	charts, posters
Teach Me About Series McGraw-Hill Book Co. 330 West 42nd Street New York, New York 10036	flashcards, charts

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Coronet Films 65 East South Water Street Chicago, Illinois 60601	"We Explore the Field and Meadow" "The Muddy Raindrops" "Birds of the Countryside" "Animals & Their Food" "Birds of Our Storybooks" and numerous other films and film-strip titles
Dimension Films 662 North Robertson Los Angeles, California	"Rainshower" With teacher Guide
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U.S. Forest Service U.S. Department of Agriculture Washington, D.C. 20250 or Your region (Illinois, Indiana, Iowa Minnesota, Missouri, Ohio, Wisconsin) 633 W. Wisconsin Avenue Milwaukee, Wisconsin 52303	"Patterns of the Wild" and many other titles "National Grasslands, The"
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Albany, New York 12201

National Geographic
National Geographic Society
Washington, D. C. 20036

National Wildlife
National Wildlife Federation
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* Nature Study Aid Specimans NASCO Fort Atkinson, Wisconsin	Iowa Leaves, raccoon paws (front & rear)
* Bureau of Land Management U.S. Department of the Interior Washington, D. C.	"Meet Johnny Horizon" - Kit, for keeping our land clean
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Handicapped Children's
Nature Study Center

September 1970

P H O N O G R A P H

R E C O R D I N G S

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Ansley, Hudson & Sandra
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33 1/3 rpm, 12 inch
Illustrated 27 page booklet

Dawn In A Duckblind
Allen and Kellogg
33 1/3 rpm, 10 inch
Color photo text - guide

Phonograph Recordings (con't.)

Evening In Sapsucker Woods, An
Laboratory of Ornithology
Cornell University
33 Sapsucker Woods Road
Ithaca, New York 14850
33 1/3 rpm, 10 inch

Field Guide to Bird Songs, A
Allen, Kellogg & Peterson
Eastern & Central North America
Goes with Roger Tory Peterson's
A Field Guide to the Birds

Music & Bird Songs
Laboratory of Ornithology
Cornell University
33 Sapsucker Woods Road
Ithaca, New York 14850
33 1/3 rpm, 10 inch

National Network of American Bird Songs
Stillwell, Jerry & Norma
Vol. 1 - Bird Songs of Dooryard, Field, & Forest
Vol. 2 - Bird Songs of Dooryard, Field, & Forest
Vol. 3 - Western Bird Songs of Dooryard, Field, & Forest
33 1/3 rpm, 12 inch records
Ficker Records
Old Greenwich, Conn.

Songbirds of America In Color, Sound & Story
Allen and Kellogg
33 1/3 rpm, 10 inch
Text - photo, color, guide
24 species

Sounds of Nature
33 1/3 rpm, 12 inch record
Federation of Ontario Naturalists &
Cornell Laboratory of Ornithology

Sounds of Spring
Gunn, William W. H.
33 1/3 rpm, 12 inch record
Federation of Ontario Naturalists

Wild Animals
Talking Picture-Story Study Prints
Society for Visual Education, Inc.
Chicago, Illinois 60614
33 1/3 rpm, 12 inch record

B I B L I O G R A P H Y

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Kunau, Emelda & Moorman, Robert,
Iowa State University of Science
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January, 1969, Pm - 446 &
Pm - 447, 11 pages each

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Bulletin 1957, No. 16
Effie G. Bathurst, Wilhemina Hill,
U.S. Department of Health, Education
& Welfare,
Washington, D. C.
75¢

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U. S. Department of Agriculture
Forest Service
Pacific Northwest Region
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Robert O. Bale
Burgess Publishing Co.
426 South 6th Street
Minneapolis, Minnesota 55415
1959, 120 pages

Exploring Nature and Exploring the Local Community

Teachers' Guide / Trial Edition
African Primary Science Program
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Newton, Mass.
July 1969, 25 pages and 16 pages

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Margaret Milliken, Austin F. Hamer, Ernest C. McDonald
Burgess Publishing Co.
426 South 6th Street
Minneapolis, Minnesota 55415
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Betty van der Smissen & Oswald H. Goering
The Iowa State University Press
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Oregon State System of Higher Education
Ernest C. McDonald, Television Instructor
Off-Campus Instruction Programs
Portland Center for Continuing Education
Post Office Box 1491
Portland, Oregon 97207
1969, 42 pages

Nature Recreation, Group Guidance for the Out-of-Doors

William ("Cap'n Bill") Gould Vinal
Dover Publications, Inc.
180 Varick Street
New York, New York 10014
1940 & 1963, 310 pages

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Charles L. Mand
Charles E. Merrill Publishing Co.
1300 Alum Creek Drive
Columbus, Ohio 43216
1967, 180 pages, $2.95

Outdoor Education

Julian W. Smith
American Association for Health, Physical Education & Recreation
National Education Association
Washington, D. C.
1964, 32 pages

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Julian W. Smith, Reynold E. Carlson, George W. Donaldson & Hugh B. Masters
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Englewood Cliffs, New Jersey
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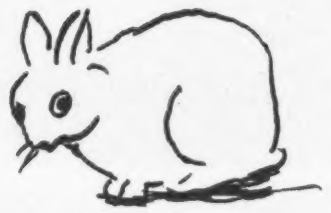

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State Department of Education
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Edited by Matthew J. Brennan
J. G. Ferguson Publishing Co.
Chicago, Illinois 60602
1968, 1968, 1,133 pages total

a) Grades 1-2-3
b) Grades 4-5-6
c) Science 7-8-9
d) Social Studies 7-8-9
e) Social Studies 10-11-12
f) Biology
g) Home Economics 9-12
h) Outdoor Laboratory 1-12

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Department of Agriculture
U.S. Forest Service
Portland, Oregon
1964

Putting Conservation to Work, Tools to Help Teachers Put Conservation to Work in the Existing Curriculum

U. S. Department of Agriculture
Forest Service, Pacific Northwest Region
Portland, Oregon
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Charles E. Merrill Publishing Co.
Columbus, Ohio
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Donald R. Hammerman & William M. Hammerman
Burgess Publishing Co.
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Minneapolis, Minnesota 55415

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Robert E. Brown & G. W. Mouser
Burgess Publishing Co.
426 South 6th Street
Minneapolis, Minnesota 55415
1964, 112 pages

S A M P L E

EVALUATIVE INSTRUMENTS

Unit II

Evaluative instruments should be different for each group of students, and sometimes for each individual student as well as from teacher to teacher. Each evaluative instrument will probably be different for each situation.

THe following six evaluative instruments, therefore, are merely samples of possible ways to evaluate your particular students. Gear your evaluations to the objectives you have established for your students.

When you have developed particularly effective evaluational methods, please share them with others by sending copies to the Handicapped Children's Nature Study Center.

A. Check List 1-3

B. Fill-In, Drawing, Sketching 4-6

C. Objective 7-8

D. Subjective 9

E. Teacher Comments On Behavior 10

F. Verbal Tests Of Students Knowledges 11

S A M P L E

A. CHECK LIST

Unit II Guide I

Students Name _____ Date _____

The teacher will need to list the objectives for her own particular group.

Educational Objectives	Check Complete	Partial	None	Comments
1. Each student should observe, using as many senses as practical, the six major parts of the environment (or the effect of one part on another).				
2. Each student should observe several different soils.				
3. Each student should observe several different aspects of the atmosphere.				
4. Each student should observe water in several areas.				
5. Each student should observe several different plants.				
6. Each student should observe several different animals or signs of animals.				
7. Each student should observe man's activity in the out-of-doors.				
8. Each student should observe the environment as a whole - "The Web of Life" - ecology - interdependency of all six components.				

S A M P L E

A. CHECK LIST

Unit II Guide I

Students Name _____ Date _____

The teacher will need to list the objectives for her own particular group.

Educational Objectives	Check Yes	Check No	Comments
1. Each student should observe, using as many senses as practical, the six major parts of the environment (or the effect of one part on another).			
2. Each student should observe several different soils.			
3. Each student should observe several different aspects of the atmosphere.			
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8. Each student should observe the evnironment as a whole - 'The Web of Life' - ecology - interdependency of all six components.			

S A M P L E

A. CHECK LIST

Unit II Guide I

Students Name _____ Date _____

The teacher will need to list the objectives for her own particular group.

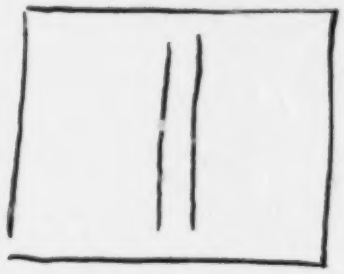
Educational Objectives	Check					Comments
	Did+	Did	½Did	Tried	Didn't	
1. Each student should observe, using as many senses as practical, the six major parts of the environment (or the effect of one part on another).						
2. Each student should observe several different soils.						
3. Each student should observe several different aspects of the atmosphere.						
4. Each student should observe water in several areas.						
5. Each student should observe several different plants.						
6. Each student should observe several different animals or signs of animals.						
7. Each student should observe man's activity in the out-of-doors.						
8. Each student should observe the environment as a whole - 'The Web of Life' - ecology - interdependency of all six components.						

S A M P L E

B. FILL-IN, DRAWING, SKETCHING, ETC.

Unit II Guide II D

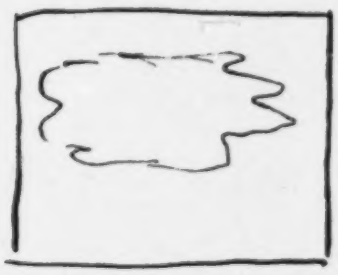
If you were building a plant, what parts would it need?



Stem?____

Leaves?____

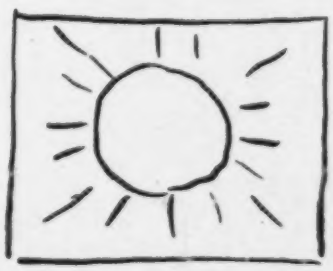
Roots?____



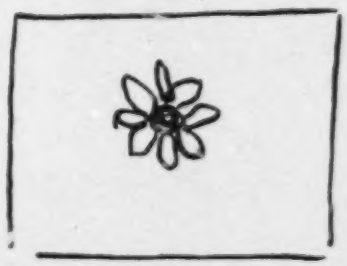
Air?____

Water?____

Soil?____

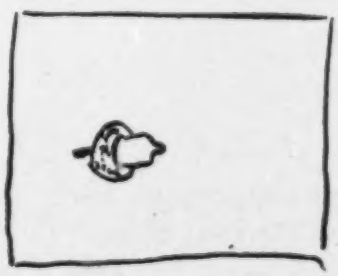


Sun?____



Flowers?____

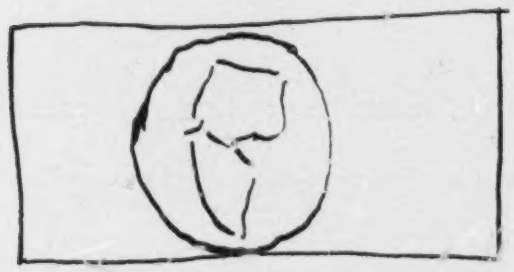
Fruit?____



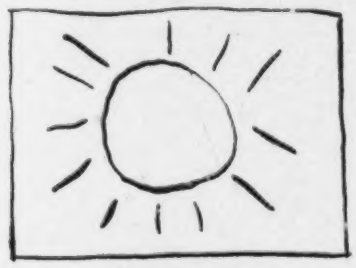
Seeds?____

B. FILL-IN, DRAWING, SKETCHING, ETC.

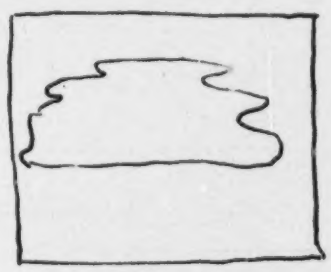
Unit II Guide III



If you were building a world for a plant to live in, what would you put there to help the plant to live?



Sun?____



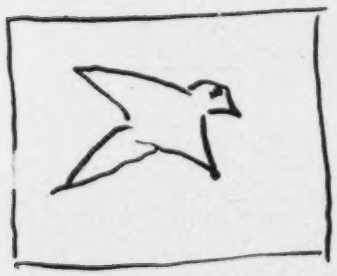
Air?____

Water?____

Soil?____

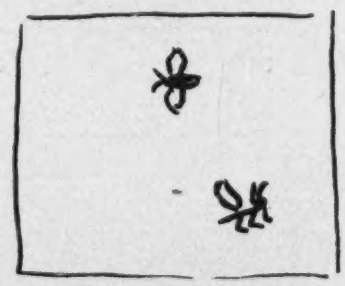
Another Plant?____

Trees?____

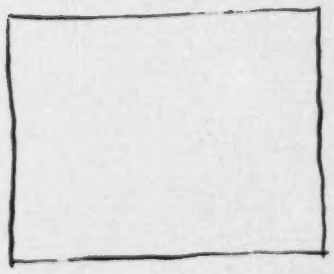


Birds?____

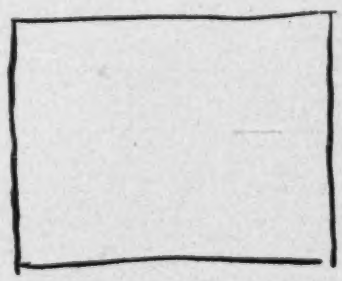
Man?____



Invertebrates?____
(bugs, insects)



?____



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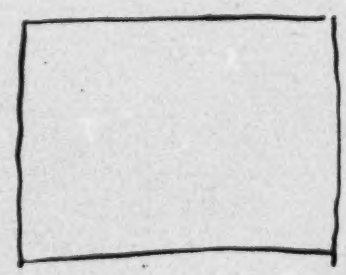


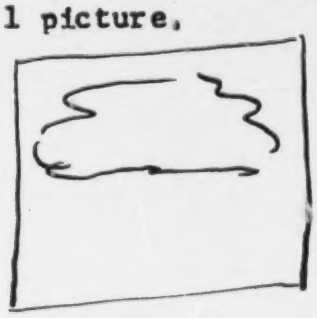
?____

S A M P L E

B. FILL-IN, DRAWING, SKETCHING, ETC.

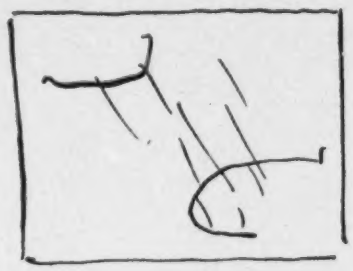
Unit II Guide III

Draw the six components of your environment - separately or together in 1 picture.

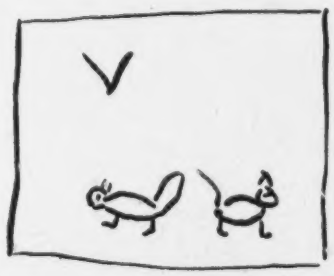


Air_____

Soil_____

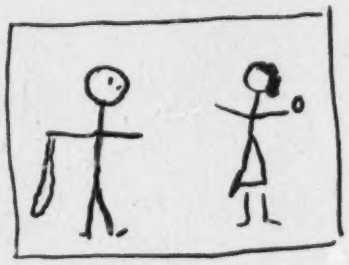


Water_____

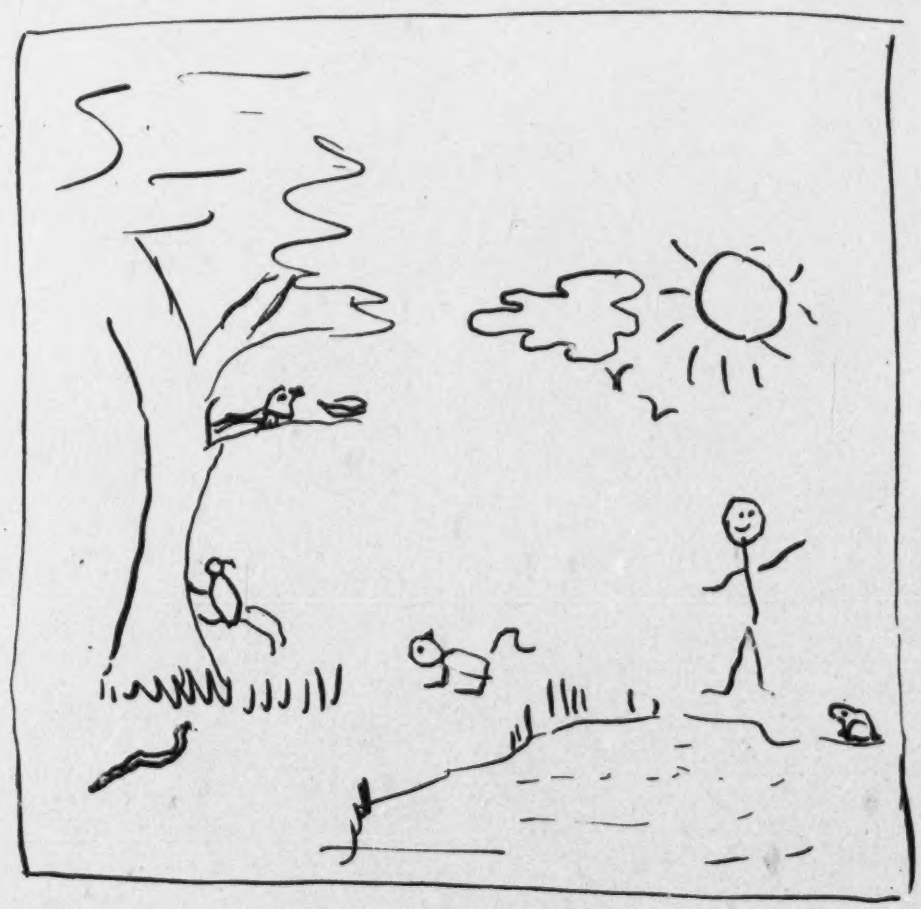


Animals_____

Plants_____



Man_____



Total Environment

C. OBJECTIVE TYPE TEST

Unit II Guide I

The following questions are merely samples. Each teacher's test will need to be made up according to her students, to her curriculum and to her methods of teaching. Some of the following questions may duplicate information in different types of questions. Some will be elementary, others will be more advanced.

1. List the five different forms of water you observed.

2. Use each of the following vocabulary words in a sentence:

cloudy	insect
clay	litter
puddle	environment
fern	

Use words <u>your</u> students are learning.

3. Which <u>one</u> of the following belongs to the component Air? Circle.

Humus	Pond	Mammal
Flower	Smog	Road

4. Using 3 senses, observe the soils on the front table. List the name next to the correct number.

1.	3.	5.
2.	4.	6.

5. List the rules we learned regarding the sense of taste.

6. List the six components of our environment.

a.	c.	e.
b.	d.	f.

7. Match column <u>A</u> with column <u>B</u> - 2 from column B per column A.

<u>A</u>	<u>B</u>
1) Air _____,_____	a) Puddle
2) Soils _____,_____	b) Root
3) Water _____,_____	c) Rainbow
4) Plants _____,_____	d) Humus
5) Animals _____,_____	e) Seed
6) Man _____,_____	f) Worm
	g) Stream
	h) Litter
	i) Clay
	j) Pollution
	k) Cloud
	l) Insect

C. Objective Type Test (con't.)

8. With eyes closed (blindfold, work in pairs) feel the 3 items on the front table. Describe the texture of each. (and shape, etc.). (Pebbles, wood, stems, etc.)

9. With which components did we use the following words:

Stars, clouds, sunset _____ Root, flower, seed _____
Rock, clay, humus _____ Bird, reptile, worm _____
Stream, pond, puddle _____ Litter, machines, beauty _____

10. Where were these soils noticed?

Rock - Humus -
Clay - Sand -
Topsoil - Mud -

11. List all six parts of our environment observed out the window.

12. List 4 signs of animals we observed on our walk.

a -
b -
c -
d -

Some Review Questions:

1. What differences are felt in nature? List.

2. Wildlife eat wild plants in nature; therefore, it is all right for humans to do the same. True or False.

3. State the five levels at which we observe in nature.

4. List the rule(s) we learned regarding the sense of taste.

S A M P L E

D. SUBJECTIVE TYPE TEST

Unit II Guide I

The following questions are merely samples. Each teacher's test will need to be made up according to her students, to her curriculum and to her methods of teaching. Some of the following questions may duplicate information in different types of questions. Some will be elementary, others will be more advanced.

1. Write a short paragraph on what you observed with your five senses in each of our six environmental components. (Or, have student choose just one component).

2. Briefly describe each of the different aspects of air we observed on our walk.

3. Describe what it might be like living <u>without</u> one component of our environment.

4. How would you go about getting a vacant lot cleared of litter, kept that way and made more pleasing to the eye and useful to the community?

5. Describe briefly each of our six environmental components. (Or, have student describe just one of the components.)

6. Briefly explain what "man" encompasses and in what ways "man" is like plants, animals, soil and water.

Some Review Questions

1. Write a story about your taking a friend into nature and showing him how to observe using his five senses.

2. When you observe an outdoor area - what do you do?

3. Wildlife eat wild plants in nature; therefore, it is all right for humans to do the same. Why or why not?

4. Does everyone observe the same thing(s)? Why or why not?

S A M P L E

E. TEACHER COMMENTS ON BEHAVIOR

Unit II

The following comments are more on behavior than actual academic learning. This is just a sample. Each teacher should add or delete similar comments according to her objectives, and the particular student.

(Note - Teacher has observed student 'B' throughout several Outdoor Education lessons.)

'B' was with his study group in all activities, but he did not always participate. He seems to always have to be first to start and first to finish, regardless of quality and/or thoroughness. When he is not first, he tends to become moody, sulky and outwardly disinterested in the activity. He finds fault with others and often teases them. Sometimes with individual teacher encouragement and assistance 'B' will attempt activities that his group is doing.

But, 'B' still tries to beat everyone else in completing the activity.

Perhaps he should have more individualized activities for awhile - to chart and compare quality and thoroughness with himself.

S A M P L E

F. VERBAL TESTS OF STUDENTS KNOWLEDGES

Unit II

With students in small groups the teacher asks them questions. Students may answer verbally, point out the item, draw on the blackboard, demonstrate, or use a combination of these, etc.

The following questions are merely samples. Each teacher's test will need to be made up according to her students, to her curriculum and to her methods of teaching. Some of the follosing questions may duplicate information in different types of questions. Some will be elementary, others will be more advanced.

Guide I. (1) Point out one example of each of the six components of our environment as you look out the window.

Guide II, B. (2) By feeling these three different soils with your eyes closed tell me what each is.

Guide II, E. (3) What are some clues that animals have been near?

Guide II, D. (4) What are the different shapes of plants we observed?

Guide II, A. (5) What color is pure air?

Guide II, F. (6) What did we see on our walk that was pretty and what was unpleasant?

Guide III. (7) Briefly describe what soil does to air, water, plants, animals and man.

Guide II, C. (8) What different forms of water are there through the year?

Some Review Questions

1. What shapes did you see out the window?
2. What things look similar, but feel different?
3. State a rule dealing with the sense of taste.

T E A C H E R C O M M E N T S H E E T

Unit II

"MINI-EXPLORATIONS OF OUR ENVIRONMENT"

In order for us to make other outdoor education units more useful to you it would be appreciated if you would complete and return the following evaluation form:

Did you use the unit? Yes _____ No _____

Do you plan to use the unit in the future? Yes _____ No _____

If you used the unit, in what way(s)? (Where, length of time, month, number and type of students, etc.)

If you did <u>not</u> use it or do not plan to use it, please explain why:

What do you like about the unit?

What parts of the unit would you like changed? Please explain:

Please comment on any or all of the following aspects of the unit:

Wording -

Aims, objectives -

Set-up, typing, sketches -

Activities -

Color, print, covers -

Sample evaluation instruments -

Content: age, ability, time -

Resources, bibliography -

What other units would you like?

Please use the reverse side for additional comments.

Thank you for your assistance,

Clara A. Emlen

Clara A. Emlen
Consultant, Outdoor Education

Please return to:

Handicapped Children's
Nature Study Center
1523 South Fairmount Street
Davenport, Iowa 52802

The Handicapped Children's Nature Study Center
a Title III, E.S.E.A., project

Administered by
Muscatine-Scott County School System
1523 S. Fairmount
Davenport, Iowa 52802

Clara A. Emlen, Consultant
David M. Lanaghan, Project Director